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IN UNKNOWN ARABIA



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TORONTO



HH ABDUL AZIZ IBN ABDUL RAHMAN IBN SAUD, GCIE, SULTAN OF
NAJD AND ITS DEPENDENCIES

Frontispiece

IN UNKNOWN ARABIA

BY

MAJOR R. E. CHEESMAN, O.B.E.

REGULAR ARMY RESERVE OF OFFICERS; HIS BRITANNIC MAJESTY'S CONSUL
IN NORTH-WEST ABYSSINIA; FORMERLY PRIVATE SECRETARY TO
THE HIGH COMMISSIONER FOR IRAQ, 1920-23

F.R.G.S.; CORRESPONDING MEMBER OF THE ZOOLOGICAL SOCIETY OF LONDON;
MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION; AWARDED
GILL MEMORIAL (1925) BY THE ROYAL
GEOGRAPHICAL SOCIETY

WITH A FOREWORD BY

MAJOR-GENERAL SIR PERCY Z. COX,
G.C.M.G., G.C.I.E.

MACMILLAN AND CO., LIMITED
ST. MARTIN'S STREET, LONDON

1926

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PRINTED IN GREAT BRITAIN

TO
MY MOTHER

FOREWORD

ON the outbreak of the Great War the author of this intensely human tale of desert travel, impatient, like other patriotic young Britons, to play his part in the struggle, and anxious to avoid the inevitable delay involved in qualifying for a Commission, enlisted in the 5th Buffs, and it was as Lance-Corporal Cheesman of that Battalion that in the summer of 1916 he discovered himself to me at Basra, bearing a line of introduction from an old Service friend. That particular juncture, at the headquarters of Indian Expeditionary Force "D," was one of strenuous preparation for the coming winter's advance up the Tigris, destined, under Sir Stanley Maude's brilliant leadership, to retrieve the disaster of Kut and put us in possession of Baghdad, and the Army machine was working at high pressure for every member of G.H.Q.; but the busiest of us had our occasional hours off, and it needed but the briefest association for the Lance-Corporal and myself to discover a strong bond of sympathy and interest, in the keen love of nature which we both possessed and which even the more serious preoccupations of the moment could not entirely banish from our daily life. It was a link, at any rate, which served to keep us in close touch for the next seven years, during the last three of which Captain Cheesman, having in the meanwhile obtained his Commission, was a valued member of my personal Staff as High Commissioner of Iraq. Throughout this latter period we continued to develop, as opportunity offered, and under the easier conditions of peace, the natural history collections of which the foundations had been fitfully laid during the vicissitudes of the War.

It was primarily in the interests of zoology that Major

Cheesman planned his recent expedition to an unexplored tract of Eastern Arabia, of which he gives an account in the volume before us, and such an eminent naturalist as Lord Rothschild has borne cordial testimony to the value and interest of the results which he achieved, especially in the domain of ornithology. But while Major Cheesman's proficiency as a field-naturalist makes his observations, when treating of the fauna of the region, of particular weight and interest, his activities were by no means confined to that sphere alone. On the contrary, realising before he started that both geographical and archæological interest attached to the region which he hoped to explore, he was at pains to prepare himself by preliminary training and study—as serious travellers must do nowadays if they hope to do work of any value—to deal efficiently with such problems as might present themselves ; and the result is that he has been able to make valuable contribution to our store of knowledge in both directions.

For example, in that of geography he has not only lifted the veil from the "mystery" settlement of Jabrin, which for generations had been a name to conjure with among travellers and geographers interested in the Arabian peninsula, but he has been able to throw some useful light on the question of the drainage of the Najd uplands, a problem which has puzzled geographers from the earliest times.

Again, in the domain of archæology it will be found that the information and evidences obtained by him during his two visits to the shores of the Salwa bight, while they fall short of absolute proof, constitute strong grounds for the conclusion that the site of the Gerra emporium of the ancient geographers is to be found in the immediate vicinity of the present port of Oqair, and not at the head of Salwa Bay as was formerly supposed.

So much for the scientific or technical aspects of his journey. If we turn to the narrative itself we find in it a vivid, unvarnished record of desert travel, pursued often

under the most trying circumstances, with imperturbable patience and perseverance, enlivened throughout by a quiet sense of humour which constantly asserts itself and enables the traveller to keep good heart and make light of his difficulties.

Finally, though by common consent and understanding politics were to be strictly taboo, Major Cheesman's pages give us intimate glimpses of the regime of His Highness Abdul Aziz Ibn Saud, G.C.I.E., Sultan of Najd and its Dependencies, and now in occupation of the Hejaz and its Holy Places, who at the present time is such an outstanding figure in the Arab world, and for whom the intercourse of fifteen eventful years has left in me feelings of strong personal affection for the man and the friend, and profound admiration for the great qualities of self-reliant courage and statesmanship which have contributed so much to the shaping of his destiny.

P. Z. Cox.

*Athenæum Club,
January, 1926.*

INTRODUCTION

IN the year 1908 Lieutenant Boyd Alexander was giving me an outline of his plans for his next journey across the African desert. He had successfully crossed the continent from the Niger to the Nile, and was contemplating an even more hazardous route through to the north of his previous journey, taking in some of the waterless country of the Sudan, where he hoped to find new forms of birds and animals affected by their desert environment and differing from those of the jungle regions to the south. His grief at the loss of his brother, Captain Claud Alexander, and Captain Gosling, his companions in the Niger to the Nile expedition, had not been softened by the passing of time, and he was determined to travel alone. I asked him if he could take me, and he thought it over seriously for a moment and replied: "No, you don't want to leave your bones in Africa, do you?"

I said I should have to leave them somewhere, I supposed, and we both laughed.

He went on to unfold his hopes, if he came safely through, of making yet another journey, this time into the Arabian Desert, where no ornithologist had ever been, and where he was certain that new races of birds would be found. To trace the connection between these birds and those of the African Desert was one of the tasks still awaiting the ornithologist, he said, and it was to him a problem of absorbing interest.

On April 2, 1910, two years after this conversation, brutal assassins in Nieri, Central Africa, cut short the brave young life of a man who had already accomplished great things and whose loss to geography and ornithology can never be estimated or adequately mourned. For the next six years my own life was cast in pleasant places, in the

fair county of Kent, and a journey beyond the confines of the county horizon was an event. It would have been a bold fortune-teller who would have prophesied the usual "long sea journey." Then came the fateful August of 1914 and my enlistment in the "Buffs" lest the War should be over in three months one way or the other. Some people proved by indisputable figures that the Germans had neither men nor money to last six months, and were willing to expound this twenty times a day to all who were not too busy getting into khaki to listen to them. Then came high-pressure training to fit the Battalion for France, then rumours that secret orders had arrived that we were to embark for an unknown destination, then an issue of topees and thin khaki drill, followed by a year in India, more intensive training, another embarkation for an unknown destination, and disembarkation in Mesopotamia. Active service at last, eighteen months after the declaration of war—and with the Germans still holding out.

It was in the early summer of 1916 that I first met Lieutenant-Colonel Sir Percy Cox in Basra. He was Chief Political Officer to the Mesopotamia Expeditionary Force throughout. I had risen to be a Lance-Corporal, and was attached to General Headquarters, 3rd Echelon, in Basra. The birds in Mesopotamia were entirely new to me, and Sir Percy was the first ornithologist I had met in the country. Although he had the advantage of a long acquaintance with the birds of the Persian Gulf, his knowledge of the Iraq species was as scanty as mine; but he shared with me the desire to know them better, and we began that summer the collection which has now reached several thousand skins. During the period of the War he lent me a gun, my 12-bore, which I had brought out disguised and concealed in a kit-bag, having been lost in the battle of Shaikhs Saad. He also had access to literature, so that we were able to identify specimens as additions were made, and Captain N. B.

Kinnear of the Bombay Natural History Society, in addition to his military duties, was always ready to identify specimens sent by post.

On getting a Commission in the Indian Army, I was sent to Shaiba in the autumn, and all day and night a stream of migrant birds was passing over our tents towards the south, heading, as a glance at the map will show, for the Arabian Desert. Thinking over the journey and Boyd Alexander's words, I began to wonder whether fate, having by a miracle brought me so near, could ever be tempted further into allowing me to see the interior. The possibility seemed remote.

The end of the War saw me returning to Baghdad in August, 1920, as Private Secretary to Sir Percy Cox, the first High Commissioner for Iraq. On the journey out we had halted at Oqair in the Persian Gulf to meet H.H. Abdul Aziz Ibn Saud, the Sultan of Najd, in order to discuss matters of high politics. Here we saw the outskirts of the Great Desert from another point of the compass; this was, moreover, its entrance gate. During the next three years, the foundation of the young kingdom of Iraq left His Excellency and his staff little time. The day's work monopolised most of the daylight and often lasted far into the night. Sir Percy Cox, however, brought out at his own expense an Anglo-Indian skinner who had been trained by the Bombay Natural History Society, and during those three years at Baghdad this professional was sent on excursions which we were unable to undertake ourselves, into the farthest regions of King Faisal's territories and among the islands of the Persian Gulf, while we contributed such species as were within the reach of short journeys, and many were sent in by local enthusiasts and sportsmen. The skins were sent in batches to the British Museum (Natural History), where the authorities kindly stored them. Dr. C. B. Ticehurst worked out the birds on his occasional visits to London and kept us informed as to what were wanted, while

Mr. Oldfield Thomas, of the British Museum, gave similar assistance with the mammals. Thus we were enabled to keep the collecting on systematic lines.

These collections only fed the flame of the desire that was in me to know what species inhabited the centre of Arabia. There was nothing from the South in the museums of the world with which to compare our specimens. There had been nibblings all round the coast, but our knowledge of the fauna of the centre of the Arabian peninsula was as much a blank as the map of the same area.

The larger portion of the Great South Desert lies in the domains of the Sultan of Najd : " sphere of influence " would perhaps better describe a country which is mostly uninhabited and featureless, and where no boundaries can or do exist. Sir Percy Cox and I had often discussed the ways and means of getting a collector into the interior. The fervour of Wahhabi Muhammadanism and the fanaticism of some of its disciples made it impossible to send an Anglo-Indian, who, whatever his religion, would be classed as an idolater. The slightest indiscretion on his part might bring the wild tribesmen about him like infuriated hornets, and the consequences would be serious. The first step southward was obviously to obtain the approval and co-operation of the Sultan himself. This could only be procured if the traveller could be adjudged above suspicion of having any ulterior motive. The idea of making a collection of birds and animals, and that only, is difficult of conception by the mind of an Arab. It was equally important, in order to obtain the sanction of the scheme by the British Government, that the naturalist should be one who could be trusted not to throw sparks, even innocently, into the powder-magazine of Arab politics. It was also obvious that the man must be a field naturalist. Sir Percy Cox was the only man who could fill all three of these rôles, but, as he could not undertake the journey himself, I hoped that if he named me as his deputy, his implied guarantee would satisfy all parties.

At a meeting between Sir Percy Cox and the Sultan, at Oqair, in December, 1922, the latter was asked whether he had any objection to my travelling in his country in order to shoot birds and collect skins. The reply was characteristic: "He is welcome; but the birds are only the common ones."

We were leaving Iraq in May of the following year, and my duties prevented me from availing myself of the invitation ultimately extended, until after I reached England, so that it was not till October, 1923, that I embarked at Manchester to fulfil my great ambition. But at that time it was by no means certain that I should even see the Arabian coast. Several months had passed. In the constantly fluctuating tides of Arabian affairs the possibilities of to-day become the impossibilities of to-morrow. It was necessary to prepare for the disappointment of having to turn back from Bahrain with nothing accomplished.

The chance of getting into the southern desert was more remote still. Probably I should have to be satisfied with a journey along the caravan route to Hufuf and Riyadh, skirting the northern boundary of the Great Desert, a road already trodden by some dozen Europeans. Luckily for me in that case, they had left the fauna severely alone, allowing it to remain a blank page to be filled by those who should follow. I was carrying a letter from Sir Percy Cox to the Sultan, mentioning several places he would like me to visit if circumstances allowed. The name of Jabrin was included, but as I knew that there were no caravans passing or visiting it, that it was, in fact, isolated in a waterless desert, there seemed little chance of getting there. It was for these reasons that it had been denied to European eyes, and had been seen even by very few Arabs. Its palm-groves were surrounded by a veil of mystery, and many were the tales of wonder and magic told by the superstitious badawin who graze their camels in the vicinity. It is perhaps small wonder that this

journey took precedence in my own mind over all others. It also meant entering the land of my desire, the northern portion of the Great South Desert.

At length Bahrain and Oqair were passed, and the murmuring camels landed me at Hufuf. There were pale desert forms here, of bird, beast, and reptile, all new to me. Every day the work of collecting seemed well worth while, something fresh being either secured or marked down for a future excursion. Moreover, the suggested journey to Jabrin had not been turned down by the Sultan. It had been spoken of as a possibility, if not a probability. There was only one obstacle. There had been no rain in the South country for a year, and the bushes had not grown sufficiently to provide food for the camels. It was nine days' journey to the oasis. The camels could go without water for that period, but we should have to wait till there was rain, and then till there was sufficient grazing to sustain our beasts on the road. It was a long wait, but at last the rain came, followed by the green buds and branches on the desert bushes.

One morning a bearded and unwashed traveller was seated on a sandstone ridge. His skin had peeled from his face in large patches, and what was left was burnt nearly black by the sun. In spite of all this he was a happy man. The Arabs were making coffee in a sheltered hollow, the camels were grazing in the background. The ridge overlooked a depression which lay to the south. In the middle of the picture was a broad black patch surrounded by a frame of palest gold, shimmering in the heat of a tropical winter sun. There were the palm-groves of Jabrin, nestling in a world of desolation and of sand. The very isolation of the place gave it grandeur. The traveller's mind had gone back many years.

"No," he said. "He was right. I did not want to leave my bones in Africa. I am glad to have brought them to Arabia, to carry on the work that he would have done so much better had he but lived."

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IN UNKNOWN ARABIA

CHAPTER I

PREPARATIONS FOR THE JOURNEY

ON my arrival in London from Baghdad, after having received from the Sultan of Najd the invitation to visit him and make a collection of birds in his territory, my first step was to obtain the British Government's approval of the project and ask the permission of the Secretary of State for the Colonies, at that time His Grace the Duke of Devonshire, to avail myself of the offer. The necessary assent was given, and the Colonial Office made smooth the formalities attending the preliminary arrangements for the journey, for which my grateful acknowledgment is here recorded. The Royal Geographical Society were as usual ready to render assistance, and, on hearing of my destination, lent me a set of valuable instruments; and I was indebted to the Geographical Section of the War Office for a series of maps containing the latest work in Arabia Deserta.

On October 4, 1923, a steamer left the docks in Manchester bound for Basra, bearing my seventeen capacious packages, my Arab boy, Mehdi ibn Saleh, and myself. There are more pleasant and more rapid methods of reaching Basra than by travelling all the way by sea, and the Bay of Biscay has no attractions for me; but in the matter of Eastern travel it is well to adapt the older version of the adage and say that a fool and his kit are soon parted. If your boxes are full of clothes, it matters little if they do not arrive to scheduled time, and are out of fashion

when they do. But if, as in my case, they are packed with guns, cartridges, mouse-traps, cotton wool, and arsenical soap, and you are a naturalist, you will agree with me that it is better to travel with them, and so make sure that they arrive intact at their destination at the same moment as yourself.

My real destination was Bahrain, but since my boat went to Basra, to Basra I had to go, and there change on to the British India Company's slow mail to Bahrain, via Mohommerah, Kuwait, and Bushire. On arrival at Bahrain, though we had been some six weeks at sea, our packages still numbered seventeen, and we were ready at short notice to start on the next stage of the expedition into the interior. Had there been but one missing, it would have meant at least a week's delay, often all the difference between success and disaster. There would have been the alternative of going on without it, but on an undertaking of this kind one carries nothing that is not essential.

In underlining these small details to this extent, my purpose is to warn intending travellers of the rose-strewn and enticing pitfalls in the path. The appeal of the many far quicker ways of reaching the port available to-day, over land and by air, sending your kit round by water, is so attractive that at the outset you minimise the importance of the risk of delay, and in Arabia your chance of making good any loss is remote indeed. For the same reason I have included in the Appendices a list of the contents of the boxes, as they proved ample for a four months' residence in the country and would serve as a guide to a similar expedition, with such alterations as circumstances plus the personal element may suggest.

Having introduced the baggage, it remains for me to present Mehdi ibn Saleh, my loyal companion throughout, who will often be mentioned in this narrative. He came to me first as a servant some three years before, at the Residency in Baghdad. He had been apprenticed to his

father, an Arab of the city, as a weaver. The sedentary life had apparently palled, and he had broken the parental control in order to strike out on his own. As he was quite uneducated, openings were limited, but he had learnt to be a useful valet when he stood before me, a tall, straight lad of sixteen years, with a good recommendation from his previous employer. Our interview was short. "Would you like to be my servant?" "*Ma yekhalif*" ("It does not matter," or the Arab equivalent of "All right"). "Would you like to learn to skin birds and animals for me as well?" "*Ma yekhalif*." "What do you want for wages?" He named a sum that was a little high. My reply was, "*Ma yekhalif*." This ended the interview. In half an hour he arrived with a small bundle under his arm which contained all his worldly possessions, and next morning we left on what was the first of his travels, to Basra, Bahrain, and other islands of the Persian Gulf, including a camel journey down the Arabian coast to Salwa (Plate 10).

By the time we returned to Baghdad he had not only proved a capable servant, but had turned out some promising skins, first under my guidance, and very soon without supervision. It was only necessary for me to finish all his specimens by writing the labels. The advantage of having him with me if I should ever succeed in getting into Arabia was from now onwards apparent. The personality and qualifications of a servant are of the utmost importance on missions of this kind, especially when he is off duty, and care in choosing him is not wasted. In a Wahhabi country it is necessary that he should be a Muhammadan. Mehdi, though a follower of the Prophet, was not one who had allowed his religion to become an obsession, and I felt there was little danger of religious discussions leading him into warfare of words or blows in the bazaars or at the Sultan's Court. Nor was he of the large sect of Islam who are seized with a desire to pray when mundane tasks, such as moving heavy boxes, would otherwise require their attention.

I was assisted in my efforts to keep him with me during my journey to London, and while making final preparations in England for my journey to Arabia, by the fact that Sir Percy Cox and I proposed to take home a collection of live animals for presentation to the Zoological Gardens. These included two Arabian ostriches, a goliath heron, falcons, and other creatures, dangerous to any man not used to handling them. We had generally a menagerie at the Residency; a badger, a cheetah, a brown bear, which had arrived by aeroplane from Kurdistan, apes, a wild boar, and a pelican, were but a few of the many live animals that gravitated to Baghdad and settled at the Residency Gardens during the first three years of its existence, the fact being that both Sir Percy and Lady Cox were devoted to animals. These strange pets were usually manageable at first, being young, but as their wild nature asserted itself, it was Mehdi, of all the servants, who could be relied upon in the event of an escape to handle them without fear and with the best prospect of success.

It thus came about that he was selected to fill the rôle of keeper to the consignment, to feed and tend them on their voyage to England. During the four months I spent in London he was sent to the South Kensington Museum for a finishing course of skinning, and was able to turn out a bird's and an animal's skin of high class, and was reported to be one of the quickest workers his instructors had seen. Dressed in European clothes, and with the fair knowledge of English he had picked up, he was able to find his way across London by 'bus with more ease and precision than his master, and passed as a European until he spoke. His behaviour during his stay in lodgings in Chelsea was exemplary, and his quiet reserve and courteous manners, which never forsook him, made him many friends.

As the day of our departure drew near he reminded me of a promise I had made, that when he came to London he should see King George. On looking at the daily

papers I learnt that the King was opening a park in Wandsworth. I took the boy early, and we secured a good position on the kerb, on the route of the procession. The day could not have been better chosen for impressing a foreigner with the reception given by a great white people to their King. The pavements were packed as far as one could see, and on a bank behind us many thousands of children, each with a flag, formed a huge grand-stand. As the royal car passed, Mehdi, hat in hand in English fashion (the Arab native head-dress is not removed as a sign of respect), was within a few yards of His Majesty, who leant out of the window to acknowledge the welcome of the children. The Arab boy was more delighted with this day than with all the wonders of London, and thought the King had specially returned his salutation.

“Many an Arab would give a thousand pounds to see what I have seen with my Sahib for nothing. Have I not salamed with Melek George (King George)?” he would say to a wondering crowd of badawin gathered round the camp fire in Arabia of an evening, after I had retired to my tent.

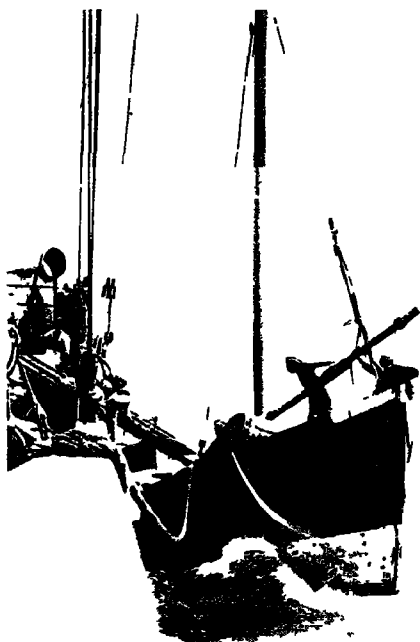
CHAPTER II

BAHRAIN

ON November 14, 1923, the British India steamer anchored in the so-called harbour of Bahrain. It is true that Bahrain can be seen from the anchorage, but owing to the shallowness of the water, the passengers have to be transferred with their baggage to small native sailing-boats (Plate 1). The sea, though shallow, is nearly always rough, and the six miles to the little stone jetty is often a wet and unpleasant ending to the voyage.

Having safely scrambled ashore, without any casualties among the boxes, I was most kindly invited to stay with Major Daly, the British Political Agent, and his wife. The official permission for my onward journey had already come through the usual channels from the Colonial Office. Major Daly had sent a message to Shaikh Abdulla ibn Jiluwi, Governor of Hasa, giving the approximate date of my arrival, and asking him to send camels from Hufuf to meet me at Oqair, the port on the Arabian mainland, and as my boat was late he thought the caravan would be already there. It only remained for me to sail to Oqair in a baghala, a picturesque Arab sea-going craft used for the pearl fisheries and commerce in the Persian Gulf.

On a previous visit in 1921 I had been taken to several places of interest in Bahrain. The ruling Shaikh was Isa ibn Ali al Khalifa, who was an old man and had reigned for fifty-four years. The more active part of the administration was left to his eldest son, Shaikh Hamad (Plate 2), who acted as Regent. The early years of Shaikh Isa's government were occupied in breaking up, with the help of the British Government, the gangs of pirates that



1 NATIVE BOAT UNLOADING FROM BRITISH INDIA STEAMER
IN THE PERSIAN GULF



2 HAMIAD IBN I-SA AL KHALIFA, K.C.II, C.S.I., SHEIKH OF BAHRAIN

infested these seas, a task by no means easy, as the rocky bays and islands made inaccessible strongholds from which they sallied out to plunder and murder the peaceful traders of the Persian Gulf. The history of the suppression of these dusky buccaneers and the curtailment of their activities in the branch industries of slave-trading and gun-running makes the annals of the Persian Gulf better reading than most books of fiction. As recently as 1910 a sea-fight took place between H.M.S. *Hyacinth* and a party of law-breakers, and there were casualties on both sides; but to-day the Gulf is as law-abiding as any other sea. The coastal tribes have turned their hands to fishing and pearl-diving and trading, and only the obsolete name of Pirate Coast, the old appellation of the Trucial Oman Coast, remains on old maps to remind the inhabitants of their pre-reformation days.

Bahrain is the largest of a group of islands on the southwest shore of the Persian Gulf. It owes its commercial importance and world-wide fame to its position as the centre of the pearl-fishing industry. Only recently a necklace of Bahrain pearls was on sale in London for £250,000. Every year some thousand picturesque sailing vessels congregate here in early summer from the coastal and island villages. Their movements are commanded by a senior authority corresponding to the admiral of a fleet. The oysters are raised by naked divers to the deck, where they are opened and the pearls extracted. The big pearl-merchants of the world have representatives in Bahrain who await the arrival of the fleet, so that it is no cheaper to buy here than in Bombay or Paris. But if one ~~ask to~~ see some pearls, a local merchant is produced, who, after fumbling in his voluminous garments, produces a soiled and tattered rag which is ceremoniously unrolled until in the nethermost corner a shining array of the jewels is revealed.

There is a side industry in mother-of-pearl, for which the shells are also gathered and landed at Bahrain. The

average pearl-oyster is the size of a Whitstable native, with a thin layer of mother-of-pearl. A much thicker layer is obtained from a larger oyster, the size of a scallop, which is collected specially for the industry. This trade was in the hands of the Germans before the war, and at the time of my visit several years' accumulations of shells were lying in heaps awaiting a purchaser.

Bahrain has also a large general trade between India and Central Arabia. British India boats and other steamers call regularly, but anchor in the outer harbour six miles from land, on account of the shallow seas. The embarkation of pilgrims in rough weather is a scene of much confusion and often of danger. The fragile craft bump against the sides of the ship as the men leap for the twenty feet of swinging rope-ladders; the veiled and frightened women are put in an old rush orange-basket attached to a crazy piece of cord, and pulled up hand over hand by their friends like bundles of cloth. There is a stone jetty near the Custom House where the sailing-boats unload cargoes, but the sea leaves it with but two or three feet of water at low tide, and even at high tide it is approached only by boats of shallow draught.

The bazaar is large, with the usual shops of an Eastern town, boat-builders, cloth-merchants selling Indian and Manchester cotton goods, weavers, coppersmiths, food and coffee shops where most of the actual buying and selling is done, and an abundance of the cheap European patent goods and trashy articles beloved of the Indian shop-keeper. The commercial population is mainly Arab, Persian, and Indian. There is an outlying village of small huts occupied entirely by freed negro slaves, who find employment in the pearl industry, many being pearl-divers. There is a branch of a British bank, and a representative of the British India Steamship Company. An American Mission supports a clergyman and a doctor with a church and a hospital in the town.

Shaikh Isa was in his winter residence on Maharraq

Island, and formal calls were made the occasion of much ceremony. On the island pier of loose rocks six guns were showing their muzzles; they look aggressive, but are used only for salutes. A large black horse, with bright-coloured trappings, was waiting for my boat in the shallow surf, held by a negro servant, who helped me to mount and led the horse through half a mile of crowded bazaar. On recognising the state livery of the Shaikh, most of the shopkeepers stood up with every sign of respect. The courtyard of the palace was thronged with retainers, some of whom shook hands, while some merely said "*Salam alaikum*" ("Peace be on you"), according to their rank. Shaikh Isa received me alone in the audience-room upstairs. He was magnificently dressed and wore the long, curved, chased-silver Arab sword. His eyelashes were darkened with black powder, and his complexion was made up with care to hide his seventy-odd years. The picture of this well-groomed old beau has made a lasting impression on my memory. He politely asked me to sit, and we exchanged platitudes until coffee was brought, followed by sweet sherbet flavoured with rose-water, which ended the refreshments. After this came rose-water in a silver flask, in which to dip the fingers. Finally, glowing incense was produced; you waft the smoke towards the face with your hand, and snuffle with visible signs of enjoyment. The call was then over, and I took my leave.

There are three physical features of interest in Bahrain: the fresh-water springs, the ancient mounds or tumuli, and a hill called Jabal Dukhan. The springs are reputed to be the outflow of water from the highlands of Central Arabia. Coming down from the mountains, the torrents disappear in the sandy plains of the Najd plateau, and, passing under the desert and the sea, rise again in and around Bahrain. One at least discharges under the sea, and so strong is the flow that native boats are able to replenish their drinking water from it. The overflow of

the land pools is carried by channels to the gardens, and as the rainfall is insufficient to support cultivation, agriculture is entirely dependent on them for irrigation.

One sees some really good date groves, extending for miles along the northern coast, and fruit gardens of pomegranate and orange trees. The tamarisk and tamarind trees grow to perfection, as well as the Indian "almond" (*Terminalia catappa*); but one gets the idea that horticulture is regarded more as a lucrative hobby of the wealthy residents than as an industry. Small sea-fish, being plentiful, are dried in the sun and used to make up the deficiency of fodder for dairy cattle. The cows much appreciate this strange diet, and the resulting milk and butter are excellent.

To the archæologist the field of ancient tumuli near the village of Ali, which cover no less than twelve square miles, has proved a problem. These mounds are of two sizes. The larger, of which there are not many, are cone-shaped hillocks of loose gravel rising some forty feet above the plain, covering tombs of big rough-hewn slabs of rock (Plates 3 and 4). Some of these buildings are two-storied. Excavations have been carried out by Major F. B. Prideaux, a former Political Agent (now Colonel Prideaux, British Resident in the Persian Gulf), who found skeletons and pottery, usually a feature of Eastern tombs, where the relatives left food and water for the deceased on his journey to the next world. There was also a portion of a carved bull, which, from the photograph, resembles some Sumerian carvings of heifers excavated in Ur of the Chaldees in 1923-4 by Mr. Leonard C. Woolley. Major Prideaux sent his specimens to India (where they are at present) to be examined, and published the results of his investigations in a paper, "The Sepulchral Tumuli of Bahrain," with some excellent photographs. Mr. Theodore Bent also opened several mounds,¹ and an account was given

¹ Major Durand also opened one of the mounds; and officers of H.M.S. *Sphynx* another.



3 THE TAREK TUMULI ON BAHRAIN, SHOWING EXCAVATION



4 BAHRAIN TUMULI: TWO-STORIED BUILDING.

by him in the *Geographical Journal*.¹ It was generally believed at that time that the remains were of Phœnician origin. The question was revived during a discussion on some mounds in Arabia after a paper read by Mr. Philby before the Royal Geographical Society in 1920, and I cannot do better than quote Dr. Hogarth on that occasion : ²

“I am afraid the evidence for calling the Bahrain mounds Phœnician is worth practically nothing. Mr. Philby has said that the tomb which Mr. Bent excavated was pronounced on very good authority to be Phœnician. So it was thirty years ago, on what was good authority then ; but the evidence on which that authority relied was certain ivories in the British Museum originally found by Layard at Kalah (Nimrud), one of the capitals of ancient Assyria, which were put down as Phœnician because it was not then known that anybody else was capable of producing that particular kind of art. Now, however, we know that it is not in any way impossible that they should have been produced by peoples of North Syria or by the Assyrians themselves ; and I think the great bulk of authority now declares that they are not Phœnician. In the tomb which Mr. Bent excavated, which had been very thoroughly plundered, he found very little except a few fragments of ivory, and it was on the strength of this ivory and of a resemblance which its workmanship bears to those ivories in the British Museum, that Mr. A. S. Murray declared the tomb which Mr. Bent had excavated to be undoubtedly Phœnician. But even if it were Phœnician, or if the ivories from Assyria were Phœnician, I am afraid it would prove nothing about the origin of the Phœnicians. As Mr. Philby has said, the Phœnicians, if they ever did migrate from the Persian Gulf, did so about 3000 B.C. The Nimrud ivories are of a much later age, some two thousand years after.”

¹ The Bahrein Islands in the Persian Gulf. *Proceedings of the Royal Geographical Society*, New Series, Vol. XII., 1890.

² *Geographical Journal*, December, 1920.

This sums up our knowledge of the Bahrain tumuli at the present day. I went down some of the trenches cut by the excavators into the centre. The chambers seemed to comprise either one or two stories. The holes where the floor rafters entered the walls showed them to have been poles with sharpened tips. Roofs were made by placing slabs of rock from wall to wall. In one mound the bottom story was T-shaped and well preserved. At the far end of the cross passage the human skeleton had been found by Prideaux, but the tomb is now the home of a pair of Barn Owls (*Tyto alba*), and I found their egg-shells and the remains of their larder of small rodents.

The number of small tumuli runs into countless thousands. They are not large enough to enclose a rock building, but recumbent skeletons were unearthed in them. This possibly indicates that they were the graves of the rank and file, while the chieftains were entombed in the more princely sepulchres; but it is difficult to make even a suggestion of their origin.

There are, as far as I know, no more burial-places like them in the Persian Gulf,¹ so it may be assumed that the builders were a small foreign community limited to the islands and the immediate neighbourhood. The Rev. C. Forster in his *Geography of Arabia* (Vol. I. p. 306), published in 1844, advances a theory as to the early inhabitants of Bahrain, which, although based on rather flimsy evidence, is as likely as any other to be correct and is certainly picturesque.

He says: "But the Themî of Ptolemy have been already identified with the Beni Temin of Bahrein, a tribe long prior to the age of Mahomet, the professed and zealous votaries of the Magian religion. In the Book of Baruch, this Hagarene race, 'the merchants of Meran and Theman,' are represented as 'seekers after wisdom' and

¹ Mr. Cecil H. Smith of the British Museum, in the discussion that followed Bent's paper, said "an enormous necropolis of large mounds like that at Bahrein was practically unique."

‘searchers-out of understanding,’ in other words as Magi or wise men. What more just or natural inference can be drawn from these historical facts than that the Magi or wise men from the East, who came to pay their homage and to present their costly offerings to the infant Messiah, and who, by consent of the learned, are allowed to have come from Arabia, were, in fact, Ishmaelites of the Magian tribe of Tema or the Beni Temin of Bahrein ? ”

In conclusion I would add that the absence of any vain-glorious rock carvings in memory of the dead in these tombs suggests to my mind that they were not a martial people, but rather scientists or peaceful traders. History relates no warlike expeditions by their princes, but it is known that on more than one occasion their neighbours of Gerra bought off with handsome presents the attentions of invaders who had announced their intention of sacking the town.

Bahrain Island is a mound of eocene chalky sandstone. In the centre is a crater-like depression, the edge of which is a steep decline and marked in places by whitish cliffs twenty feet high. Some sixteen miles south of the harbour and almost in the centre of the island, a hill, Jabal Dukhan, rises to 440 feet and is a prominent landmark for ships at sea. It is composed of much darker rock, which I had noted as volcanic, but I am left in some uncertainty on this point, since on arrival in England I find that an authority has previously called it limestone. The surrounding country is barren, but to the west of the hill there is a small *qasr* and well called Sakhr, where members of the family of the Shaikh reside when the heat of Bahrain becomes oppressive. From here the ground rises gradually to Jabal Dukhan. The last 200 feet is a steep rocky climb to the summit, and a view of the whole island is unfolded before one. There are very few birds to be seen ; a Hare was moved, a Kite (*Milvus migrans*) was soaring over the highest peak, and I shot a Hooded Wheatear (*Saxicola monacha*), a rare bird anywhere.

There is a well-concealed pirates' cave cut into the solid rock. Entrance is gained by a stooping crawl of twenty yards along a narrow tunnel, the whole being pitch dark. At the end are two small dome-roofed chambers nine feet high by six feet across.

My companion, Captain Poyntz, Royal Indian Marine, with the resource of the sailor, produced a candle-end and lighted it, as we were not at all certain where our explorations were leading us. No sooner was this accomplished, and our eyes getting accustomed to the light, than the candle was knocked out of his hand and we were plunged again into inky darkness, while we were buffeted in the face by ghostly wings. For a moment all was confusion in the very little space we had to move about in. Had I not glanced back down the tunnel and seen a form hasten towards the opening, and take wing on reaching the daylight, we should not have known to this day that our assailant was a Barn Owl whose escape had been cut off by our entrance.

We must now return to 1923, and the preparations for the journey to the mainland.

Abdul Aziz Qusaibi, a member of a wealthy family of merchants at Bahrain, is also a shipowner and is the agent of the Sultan of Najd there. The Qusaibi family has other branches at Bombay and Hufuf, with a brother in charge of each. The majority of trade with Central Arabia passes through one or all of these centres; so the volume of business conducted by the House of Qusaibi is considerable, and in the interior it not only receives the respect that an old-established and wealthy firm usually commands, but is also one of the bulwarks of the Sultan's political economy, and might be described as his Exchequer.

Abdul Aziz Qusaibi had been present at the conference some seven months before when the Sultan gave the invitation to Sir Percy Cox, and the Sultan had turned to him and said: "When Cheesman comes, make arrangements to send him on." In addition I was carrying a personal letter from Sir Percy Cox to the Sultan, bearing

greetings and giving an itinerary of the places from which we most desired specimens, among them being the Jabrin and Jafura oases. A copy of the letter had previously been forwarded to the Sultan to allow him time to make such preparations as he might think necessary.

In mentioning this letter it will be well to digress for a short time to explain a trap into which I had unwittingly fallen; and it illustrates how careful a traveller should be to sift his information before giving it to the world. The desert country commencing south of the Hufuf-Riyadh road is known only by second-hand information and reports from the badawin of the Al Murra. Not even the Arab Government officials of the present regime have ever ventured there, although the Al Murra for the first time in history have now been subdued by Ibn Saud's wonderful rule. It is small wonder that the previous Government, that of the Turks, never ventured off the road, as their power could never be exercised outside the walls of Hufuf, and the Riyadh-Hufuf road itself was in the grip of the Al Murra brigand bands.

There are few parts of the world in which no literature is available to afford some guidance, but here I searched all sources for first-hand information without avail. It was therefore natural I should lean on the only prop, Philby's *Heart of Arabia*, the latest authoritative work on this country. In the particular chapter dealing with the Southern Desert (Vol. II. p. 216), in which he took great interest, sparing no pains to collect all the information he could, he gives the account as related to him by one of the Al Murra tribe in his escort. In reading this I formed the opinion that Jafura was an oasis or a place containing the debris of a deserted city, with perhaps saline pools of water, still further south of Jabrin. Philby also boldly places it in his map some 150 miles south, with a query mark. I thought the query mark meant that Jafura might be some twenty miles east or west of the position indicated, but it never occurred to me that it lay where it did, 100 miles

north-west and west of Jabrin, and was not an oasis but a vast waterless and sandy desert through which I should have to pass on my way from Hufuf to Jabrin. Thus, in framing the letter to the Sultan, I had suggested to Sir Percy Cox the paragraph—"Most of all I am anxious that he should bring back specimens from the Jabrin and Jafura oases, as in these localities it is almost certain he will find new and interesting species," and this is the form in which the letter finally went.

It was not until I actually reached Jabrin that I fully realised the mistake. Although we had spent several days in crossing the Jafura desert, I did not associate it with the picture formed by Philby's description of a small oasis of salty pools, with the debris of a deserted city in the neighbourhood, buried in the sands several days south of Jabrin. In my interview with the Sultan, when we first got down to business, we were naturally at cross-purposes. He seemed surprised when he told me he hoped to let me go to Jabrin and I hastily added, "And Jafura as well?" "Yes," he said, "Jafura as well." It was then my turn to look surprised that he should accede so readily to the suggestion, for I little thought that the Jafura problem was a small one compared with that of Jabrin. Had Sir Percy Cox's letter been differently phrased, had it mentioned only the word Jafura, under the impression that to get there it would be necessary to pass Jabrin on the way, I should have found out too late that I could get no further than half-way to Jabrin; while the Sultan would have thought that in sending me to Jafura he had sent me to the place from which Sir Percy Cox was most anxious to obtain specimens. For me it would have been a tragedy indeed.¹

¹ Another piece of information that Philby obtained from the same source needs correction here. He says, talking of Wadi Sahba (spelt Wadi Sahaba on previous maps, but the middle *a* is not pronounced by the Al Murra), "In its bed near the crossing of the Hasa road are four wells, Al Khin with a small palm grove by its side, Al Haradh, and two others." There are no wells or palm groves in the Wadi in that district, and there is no water between Zarnuqa, Hasa, and Jabrin.



Photo. Vandyk, London.

5. MAJOR-GENERAL SIR PERCY Z. COX, G.C.M.G., G.C.I.E.
FIRST HIGH COMMISSIONER FOR IRAQ.

I have thought over this, and can only come to the conclusion that Philby and the Murri were, at the time of the conversation, south of Jabrin on the way to Wadi Dawasir. Philby was in imagination coming down from Hufuf towards Jabrin, that is, from the north, while his informant was only capable of seeing the place from where he actually was, that is, from the south, which caused the confusion in the orientation. The rest of the description given by Philby of the lands of the Al Murra tallied fairly well with the results of my own observation.

Assisted as I was by such excellent credentials and preparations, it followed that the first stage of my journey was made smooth enough. Had arrangements not been made with the Sultan at Riyadh until my arrival at Bahrain, a month would have been wasted before a reply could have been received from Riyadh, a camel being the fastest means of communication.

The next day, November 15, Abdul Aziz Qusaibi came to call and say that a baghala would be sailing the following morning for Oqair, and preparations for my comfort were being made on board. He asked after Sir Percy Cox, and said he hoped that when I reached Hufuf my hunting would lead me to the gardens belonging to his family, where there were many trees and birds were numerous.

Bahrain has a pleasant climate from autumn to spring. I joined Major Daly, who was returning an official call on the Commander of H.M.S. *Crocus*, which was anchored in the harbour. Compliments to native potentates and British Government officials in the Persian Gulf are paid with salutes fired from guns, and an omission of this, or even of one gun of the full complement due to a Shaikh, might cause a grave political crisis. As the motor launch left the ship, the Union Jack at her stern, the guns barked out a salvo to let Bahrain know that the Union Jack had exchanged salams with the White Ensign.

On November 16 I paid one hundred pounds from my

letter of credit into the Bahrain branch of the Eastern Bank, and took five hundred rupees in cash for the journey in a somewhat heavy and bulky bag. The silver coin of the interior is the riyal, the silver Maria Theresa dollar of Austria. Some of the shops in Hufuf accept rupees, but I was relying on the House of Qusaibi not only to change the rupees into riyals, but also to cash a cheque on Bahrain if I got into financial difficulties in the Hasa. There would also be time in Hufuf to consult it as to the best arrangements to make for the next stage of the journey. Paper money is not current in the Sultan's domains.

CHAPTER III

OQAIR

WE left Bahrain at 11.20 a.m. A fresh north wind necessitated a lot of tacking for the first stage; but as soon as we turned southward we ran down the side of the island, making good speed, arriving outside the harbour-mouth of Oqair at 10.30 p.m. and there anchoring. The enclosed waters are four miles in length, a spacious if somewhat shallow natural harbour, but the entrance is narrow and of course unlighted, and the captain would not risk a passage after dark. Next morning at dawn we were under weigh, and as the north wind was still blowing it took three hours to tack across the four miles of harbour to the quay. My state accommodation on this craft was just sufficient deck-room to lay out my camp bed and a chair which had been borrowed for the occasion by the Arab skipper. Meals occurred twice a day, after noon and sunset prayer. They were simple in the extreme: boiled rice and a little fat melted over it, a portion of meat or fish being occasionally intermixed with the rice. There was one side dish of dates. As I was a first-class passenger, the dishes were brought to me first, and when I had finished the crew gathered round and rapidly demolished the remainder. Tea followed, and then coffee, poured into small cups, a thimbleful at a time, from the little brass coffee-pot. The seaward side of Oqair harbour is a narrow and low sandspit, which is placed so well for the purpose it serves that it might pass for an artificial sea-wall. The headland is called Ras al Haraba.

The Sultan's representative, Abdul Rahman, Amir of Oqair, met me on the quay, led me to the official quarters

of his residence to have coffee, and introduced me to two soldiers from the Governor of Hasa, who had brought camels to take me to Hufuf. The eldest, Said, was resplendent in a crimson *zibun* or cloak, showing beneath a woollen mantle with gold-worked edge. His dark skin showed a strong mixture of negro in his ancestry. The other was a handsome lad from Najd, whom I recognised as one of the escort who accompanied me from Oqair to Salwa in 1921, on an unsuccessful search for the ruins of the ancient Phœnician port of Gerra. Said was anxious to start at once, and to lend weight to his arguments he said the camels had been waiting there several days, and there was no grazing to be had in the neighbourhood. Also he was afraid Ibn Jiluwi would be annoyed at their prolonged absence, and he himself might be required for other service.

It did not suit me to be hustled into an early departure. Oqair was the first place of which it was necessary to have the latitude and longitude. Its position had been provisionally placed on maps, but had never been correctly determined. It would hardly have been wise to explain this in so many words. A theodolite is an alarming-looking instrument at any time, and as this was the first to arrive in the Sultan's dominions, it seemed wiser to prepare the ground and not imperil the success of the future stages of my expedition by arousing suspicions. It was probably well known that I had come with the express purpose of shooting birds; at the same time I felt I should be on a period of probation for the first week or so, lest designs less innocent should underlie the pursuit of ornithology. For my realisation of the possibility of this suspicion I have to thank two young Americans I had met in Basra. They had learnt of the objects of my journey with a merriment they could scarcely conceal, and I feel sure they thought the pose of collecting birds was ingenious and original, and that a man could only be making such a journey for either gold, oil, or diamonds. They decided,

however, to keep up the comedy until we parted, when one said with a meaning smile, "We hope you'll catch a lot of sparrs."

An excuse which seemed plausible for delaying my departure from Oqair by two days occurred to me. During my previous visit some burrows of a Mole-Rat (*Nesokia*) had been marked down, and in such an isolated position, with forty miles of sand-dunes on one side and the sea on the other, a colony of these rodents promised to be interesting. I told the Amir and the soldiers that I would set traps for them on two nights and should be ready to start the morning after. Said still demurred, and had to be finally silenced by permission to go on by himself with the camels if he thought the Governor required his presence. We were fortunate in catching one *nesokia*; they usually refuse to take notice of baited traps. It was the same as the Iraq animal (*N. buxtoni*) to our north with 400 miles of desert between. How the colony arrived at the little bed of rushes, about 100 yards long by 50 wide, and what they exist on is still a mystery to me.

The problem yet unsolved was how to introduce the theodolite, for evening was approaching and it was necessary to start work on the stars as soon as they were visible. We were again all gathered in the guest-room, when the aromatic smell of the coffee in course of preparation gave me the inspiration. Beginning with a description of the birds in the British Museum, which came from all the world, with the exception of the lands ruled by Ibn Saud, I went on to say that I hoped to fill up the blank, but it was necessary when we collected birds and animals in lands unknown, that readings on the stars and sun must also be taken, in order to prove on my return that I had actually been to the place; otherwise someone might say that I had never been there, and that the birds had been shot at Bahrain. The figures given by the stars were different for every part of the globe and were an absolute proof. All listened intently, and the Amir asked how anyone

could know what the correct numbers should be if no one had been to a place before. This was not expected, and I felt that the assembly were awaiting my answer with unusual interest. Luckily the reply that came uppermost was one that had a permanent and reassuring effect. "There are in London," I replied, "wise men who know the correct numbers for Constantinople and Bahrain, and they are able to calculate the correct readings for other places lying between. They will therefore be able to tell whether I am speaking the truth." "Of course," said the rest, looking at the Amir, "we all knew that! What an absurd question to ask!"

The crisis passed, no time was lost in unpacking the instrument and getting to work, Mehdi holding the book, chronometer and lamp, while I read the instrument and took east and west stars for longitude and the Pole-star for latitude. Night work with a theodolite is almost impossible single-handed, and though Mehdi became very handy and, picking up the routine, reached me the things required without my having to ask for them, I sorely missed the help of a second man who could do the booking on these occasions and check my work. Next day we took the sun east and west of the meridian and on the meridian to check the previous night's figures.

There are few birds on the coast or inland in this sand-cursed little port. The soft dune desert comes almost down to the sea, leaving a mile or so of saline flats yet unsmothered. On the end of this are perched the little stone jetty, the Fort, and a large custom house, which compose the town of Oqair. The Amir, a Revenue and passport Mamur and his clerk are marooned here, and are the only residents. They regard it in the light of a penal settlement, and long for the advancement which will take them to a more congenial post. If the settled population is small, the moving part is numerous and varied. Several times a day sailing ships come in to unload bales of cloth and rice and other goods of commerce for the interior, all

packed in suitable bundles for camel or donkey transport. Relays of camel caravans and parties of the large white asses from the Hasa come from and disappear over the sand-hills, carrying the most astounding weights, so embedded in and hung around with packages that only two ears and four legs are visible. Except in the date season, when a few surplus bales of the fruit are available for export, the imports far exceed the exports, the latter being negligible. The desert produces little required by the outside world.

The passport is a simple document printed in two languages, Arabic and English, as follows :—

Sultanate of Najd and its Dependencies. To whom it may concern. Certified the bearer is a subject of Najd and its Dependencies, and it is requested he may be allowed to pass without hindrance; age, height, colour of eyes, occupation; then follows the signature or seal of the official. The photograph, it will be noted, has to be omitted in a land where no cameras exist.

It will be clearer if, before I go further into the interior of the country, the status of Abdul Aziz ibn Saud, Sultan of Najd and its Dependencies (Frontispiece), is explained for the sake of those who are not followers of Arabian affairs. From the moment of landing at Oqair I was in the territory of a sovereign independent of any neighbouring State or foreign Power. Descended from a long line of chieftains, the present Sultan has made and holds a vast kingdom by his own sound statesmanship. The religious bond holding the tribes and townsmen together under his leadership is their adherence to Wahhabism, the teaching of Abdul Wahhab, who first preached the return to the worship of the one true God as laid down in the Quran, and denounced the idolatrous practices that had crept into his worship at the Holy Places, such as Medina, Mecca, and Kerbela. The Sultan wields spiritual control over the followers of the sect, in addition to his command of their worldly affairs as their Shaikh of Shaikhs, Chief of

Chiefs, or Sultan, a position for which his strong personality and born aptitude for leadership are mainly responsible. Preaching and religious teaching and education are left to the Mullahs, who are in charge of the mosques, though when away from the towns the leading of prayers is a duty that falls usually to the senior of the party or to anyone else if the spirit moves him.

Before I leave the Wahhabis, the Ikhwan, an even more ascetic branch of the sect, must be mentioned, since their activities have often brought them into notice in the European Press. This society was founded by the great Sultan himself and shows his genius for harnessing and controlling the energy of an unruly element, an achievement that stamps him at once as a statesman in contrast to most other Eastern notables, who, being mere politicians, are wont to fire the passions of a section of a community only to find the conflagration far beyond their control. Often the fury that they hoped to guide to their own advantage is turned against themselves, and invariably damages the body of which the section is but a subsidiary portion.

Not so the Sultan. The tribes which comprise the majority of his subjects are among the proudest, most independent of spirit, and most difficult to control of any of the older nations of the earth. Each tribe, sometimes little more than a large family, is usually at feud with its neighbour; grazing is barely sufficient to feed the flocks and herds; marked boundaries do not exist, and it is natural that questions of ownership should be settled by fighting, which becomes an annual affair, while the looting of camels grows into a habit.

It is this turbulent element that has been converted by the Ikhwan movement into a military force more or less controlled by the State, for the service of which its recruits are always available. No fighting between two subject tribes is allowed without the consent of the Sultan, who has an opportunity of settling the dispute without bloodshed.

No Shaikh dare take the law into his own hands. He is now in charge as a representative of a central government, and mutineers are severely dealt with. Thus peace reigns within the borders as it never reigned before. The trade routes traversing hundreds of miles of the interior are as safe for the traveller as an English country road. In contrast to this was the Turkish rule in Hasa, which the Sultan ended in the spring of 1913 by sending the surrendered Turkish garrison of Hufuf under escort to Qatar, whence they took ship to Basra. Up to this time the Government exercised no control beyond the walls of the town, and the tribes levied a heavy toll on life and property on the caravan roads and up to the very gates.

The appeal of the Ikhwan creed to its disciples is religious; the demands made on them are much the same as with the Wahhabi, but even more rigorous. Ikhwanism is the modern revival of Wahhabism, and to-day has superseded it. Alcohol and tobacco-smoking are, of course, anathema. The only reward I could see for its followers was a sense of self-righteousness and superiority to fellow-creatures in this world and the assurance of salvation in the next. Their code develops something akin to an intense national feeling. The term Wahhabi is becoming, if it has not already become, obsolete in the interior, though it retains its old significance outside the Sultan's domains. The fall of Najran, mentioned later, was announced in Hufuf as, "The Ikhwan have taken Najran." The term here did not mean that a certain sect of Wahhabis had captured the town, but denoted the Sultan's troops generally. But the European Press would have worded the same announcement as "The Wahhabis have taken Najran."

Enlistment in the Ikhwan ranks is voluntary. A whole tribe or only certain members of it may become Ikhwan. Simplicity in dress is essential, and they mostly deny themselves even colour. The head-dress and *agal* of white are worn, if possible, and as the washing of clothes

is not one of the compulsory articles of the creed, it seems to be numbered among the pomps and vanities. All other sects of Muhammadans, such as Sunni and Shia, are lumped with Hindus and Jews and Christians as infidels. The Sultan has therefore a wide choice of subjects of disagreement which might provoke a Jihad or religious war, and he could call up large numbers of the Ikhwan for active service beyond their tribal boundaries. In times of peace they return to their tents, and, receiving no Government pay, are not any encumbrance to the State.

I have said that no two subject Shaikhs dare attack each other; but fighting occurs where tribal boundaries march with those under alien rule, that is, beyond the Sultan's frontier. Here much the same old order of raid and counter-raid continues, each side submitting to its own Sultan in due course its own exaggerated and garbled account of the affair. Here the word "Ikhwan" is loosely applied by the other side to any of the tribesmen owing allegiance to Ibn Saud, although it is possible there may be not one Ikhwan in the foray; and though the use of the term Ikhwan implies that the fighting is taking place under the Sultan's direction, it is quite probable that he knows nothing about it until three or four weeks after, when the first breathless messenger arrives with the news.

With this rigid form of Muhammadanism in the ascendancy, it can be realised that a general policy of Arabia for the Arabs and exclusion of the foreigner is observed in the interior. Here the Jew is not found competing with the native financier, because he is not allowed inside the frontier; and for the same reason the Babu Indian, the Greek or the Armenian trader and moneylender do not batten on an industrious population as they do in most other towns of the East. The Sultan since his first rise to power has based his foreign policy on friendship with Great Britain, with whom he is in intimate treaty relations. Within his State his civil and military government, finance and

the defence of his frontiers are his own affair. His boundaries are far-flung in a land where there are no telegrams and few routes on which a horse can be used. On account of the absence of water the camel becomes the fastest means of communication ; an urgent message to a border town and the reply to it might take from two to three months. For short journeys of a day or two a camel could be pressed into covering sixty miles a day by trotting a fair proportion of the distance ; but for longer expeditions thirty miles a day would be a good average. With exceptional preparations much faster rates have been recorded, and an Arab's camel-journey yarn generally ends with a postscript that such was the jolting that the rider's stomach fell out after he had delivered his message, to guarantee the veracity of the most fabulous of stories.

The afternoon of November 17 was occupied in setting traps, and I took a gun in case we met with any birds I wanted. We were a mile from the Fort when my attention was attracted to a zizyphus tree in which some birds were settling. It was in a small garden with a brackish well and water-lift from which a very small patch of lucerne is irrigated. Near by, a fortified well of sweet water stands on the edge of the sand-dunes, and on this the inhabitants of Oqair¹ are entirely dependent for their drinking water. The locality is called Abu Zahmul. Being the only cultivated spot in Oqair, the garden promised good hunting. I had hardly arrived at the tree before I found I was in the midst of an extensive ruin-field (Plate 6). Wherever we looked there were mounds of rubble and broken pottery with blue glaze in varying shades. I was well acquainted with the appearance of ruined cities in Susa, Babylonia, and other well-known sites in Iraq ; this only differed from them in height, as none of the mounds were more than six to eight feet high ; but the outline of large houses and streets could be traced. There seemed to be every reason to believe that

¹ Pronounced Ojair.

I had at last found the site of the ancient Phœnician port of Gerra.

The position of the ruins at Abu Zahmul is exactly that indicated by Ptolemy in his Geographical List published about the middle of the second century A.D. as the position of Gerra. It is for this reason, combined with the strong resemblance between the two names, that Oqair has been held to have the strongest claims to be the site of Gerra, and also because it is the best-sheltered harbour of any of the claimants. But no ruins have ever been seen or reported there, and Qatif, Salwa, and other small bays have found supporters. Among those in favour of Oqair was Sprenger, the German historian who wrote in 1875 his *Ancient Geography of Arabia*, in which allusion was made to Gerra, and my mother has kindly supplied translations from this volume. He says: "This name is often met with and is always written as 'Gerrha': only Pliny writes it once as Carrhæ." "Ger'â means a place or spot where nothing grows." This last certainly fits Oqair. "In al-Ahsâ (Al Hasa) there are camping grounds and strong domiciles of the Tamym, particularly the Tamym tribe Sa'd." The Beni Tamim were famous people before the days of the Prophet, but I do not know what authority there is for attributing to them the buildings of Hasa. "Their (the Tamym) market stood on a sand-hill which was called al-Ger'â and here the Arabs [badawin] carried on their barter." "And here, quite close to the later capital Lahsâ [Al Hasa], lay once upon a time al-Ger'â." "The passage quoted from Pliny according to my [Sprenger's] reading refers to the Bay of Gerra. The town [he means the port] of Gerra measures five Roman miles in circumference, and has towers built of blocks of salt." "Ptolemy misplaces the town Gerra on the coast, and he means without doubt Al Oqayr [Oqair]." "Inasmuch, therefore, as Gerra is the starting-point of a road, it corresponds with al-Ger'â. The bad habit which the ancients had of giving the sea harbour the name of the



6 THE RUIN FIELD OF ABU ZAHUT, OQAIR



7 THE SINGING SANDS, THE HARBOUR AND FORT, OQAIR, SEEN FROM THE HUFUF ROAD.

capital has brought about this confusion." "At Carrhæ the natives originally assembled to a fair. Later on it became an Emporium for trading in spices." "Juba asserts that originally the spice trade, more especially in incense, from the depot of Carrhæ went across Arabia through Tayma [Taima, Hejaz] to Palestine." ¹

The ruin-field at Oqair lies about a mile from the waves, on rising ground, which suggests that it might once have been on the seashore. The low ground in front of it is such as might have been left by a receding sea, and is even now but a few feet above high tide. The wide shell and coral strand along the shore-line from here to Salwa may indicate that in comparatively recent years the land level has been raised and the sea's depth consequently reduced. Earthquakes have occurred in Hasa in recent years. I thought I could trace the ruins of a sea-wall and a wall surrounding the city, but everything is now almost levelled to the ground. It would have required more time that I could spare to get a good idea of the lay-out of the buildings. I estimated the extent as being one mile by half a mile, and longest northward and southward, that is, longest along the seashore, if my surmise as to the seashore is correct. There were one or two mounds beyond the rest of the ruins which might have been forts. Walls had been built of slabs of coral rock which could be obtained on the coast. The two wells now existing, one sweet and one brackish, would be insufficient for the supply of a city of this size. There must have been others which have dried up or have been buried by the sand-hills advancing from the north and west; that area of the ruins is already partly engulfed. The brackish well and the little garden seemed to be in an open square. The only other vegetation was a large dark-green patch of *Raka* bushes (*Salvadora persica*), which may be a relic of the time when

¹ The literature on the port of Gerra is widely distributed and ranges from the works of the oldest historians to those of the present day. In my research I have also had the assistance of a book not yet published by Sir A. T. Wilson, who kindly placed his memoranda at my disposal.

it was inhabited. I did not notice this particular shrub anywhere else in the deserts and towns of Hasa, and the nearest recorded example we have of it is some that Philby found in Wadi Dawasir. It is considered invaluable even at the present day for polishing the teeth. In spite of the continual excavation that takes place round the bush in search of the root, the cluster seemed to be thriving.

On my return from Jabrin some four months after, I paid another hurried visit to the ruin-field to take photographs, and picked up some of the pottery that was lying on the surface, and one small copper coin. These were kindly examined by the authorities at the British Museum on my arrival in England. Mr. Hobson said of the pottery that it was the blue glaze which was not only known to craftsmen of the very earliest times, but has also been made right up to the present day. It is therefore very difficult to date, but he was of opinion that the specimens were of about the sixteenth century A.D. There was one piece of a jar, the ornamentation of which resembled Japanese work as much as it resembled anything, which he was unable to place. Mr. Allen described the small copper disc as a sixteenth-century Turkish coin, possibly minted at Mocha.

Had I been able to stay longer and excavate a foot or two below the top layer, it might have been possible to unearth relics of an older period, at any rate contemporary with the foundations of the walls. From the scanty evidence, we can only conjecture that the last occupants were men of the sixteenth century, and these might even be tented badawin camping on the ruins.

This discovery compensated me for an earlier failure. In 1921 I had come to Oqair and had travelled by camel and boat all down the desolate coast to Salwa specially to search for it, without finding anything to suggest the missing city, and must have passed within a mile of these very ruins, but just out of sight of them. A brief account of this journey may perhaps be interpolated at this point, since it covered a region previously unmapped and unexplored.

CHAPTER IV

THE JOURNEY TO SALWA (1921)

[*Map*, p. 33.]

ON March 30, 1921, accompanied, as in 1923, by Mehdi and two soldiers, three slaves and four dhaluls (riding-camels), and three baggage-camels sent by Ibn Jiluwi, I left Oqair and travelled southward down the coast. A baghala supplied by Abdul Aziz Qusaibi had been commissioned to accompany me, anchoring as near the coast as possible during our nightly halts to enable me to go on board, and carrying a six-inch theodolite and large ship's chronometer which had been lent me by the Public Works Department in Basra.

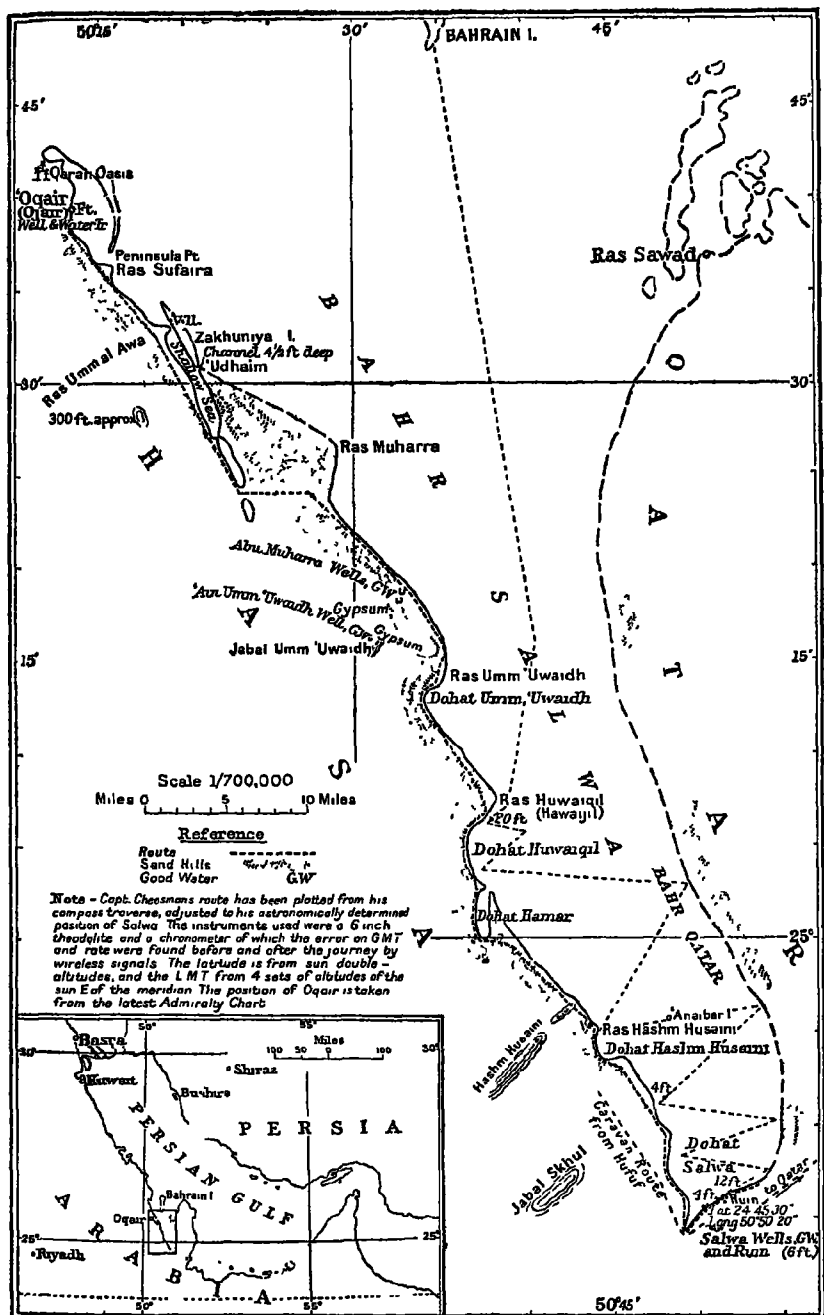
Nothing was known about the coast southward of Oqair beyond that it was a bay. In some maps the cartographer had boldly laid down an inaccurate line of his own, while the more honest map-makers had drawn a dotted line in the shape of a jelly-bag to indicate that nothing was known of its outline. The information that extensive ruins lay at the southern angle of the bay had somehow crept into official documents. It probably began with a chart issued by the East India Company, whose officers had placed the ruins in a position derived from native information, as there seems to be no record that they went down to see for themselves.¹ It thus attracted the notice of the Rev. Chas. Forster, who in his *Geography of Arabia* (1844) claims to have discovered in them the long-lost ruins of Gerra. I had not at that time read this work. Mr. H. St. J. B. Philby, on hearing that I intended to travel

¹ *The Persian Gulf Pilot*, 1915, says, "Arabs state there are extensive ruins."

down the Arabian coast in search of birds, had suggested that I should include Salwa in my itinerary and clear up this matter conclusively. The objects of the expedition were therefore threefold: to make a collection of the fauna, to discover the ruins of Gerra if possible, or bring back definite information as to the existence or absence of ruins, and to make an accurate map of the coast-line and immediately surrounding country by a compass traverse, and fix the correct position of the southern extremity of the bay by astronomical observations.

The first headland whose name could be traced was Ras Sufaira, forming one side of the entrance to Oqair harbour. The next was a sand-hill running out to a point opposite Zakhuniya, and was called Ras Umm al Awa. Here we camped and awaited the arrival of the baghala. Zakhuniya Island is a bare sand-mound. There appeared to be about twenty stone houses in the village on the west coast, and two baghalas were anchored close to the shore. There were no date-palms, but a few camels were roaming on the higher sand-hills in the background, so there must be a little vegetation. We had not been there long before the sea was invaded by a flock of several thousands of the small black Socotra Cormorant, a bird peculiar to these seas, a species of which I had just obtained the first-known eggs on a cruise round the islands of the Persian Gulf. As they fly, the leaders settle and disappear into the sea to fish, coming up to form the rear-guard, so that the progress of the flock is continuous.

The baghala arrived according to programme and anchored within a quarter of a mile of the shore, as the water is shallow and the bottom is flat rock. The little rowing-boat was able to come within twenty yards. From that evening I took meals with the crew, the usual big bowl of rice, dates, a few lumps of rather leathery meat, and flat cakes of unleavened bread. It blew hard at times during the night, and as all the crew went to sleep we might have been shipwrecked before anyone awoke.



SKETCH MAP OF COAST-LINE FROM OQAIR TO SALWA, PREVIOUSLY UNMAPPED
AND UNEXPLORED.

Next morning a little rain fell and the wind changed to north-east. The little boat rowed me ashore, and we mounted our camels and rode away at 7.30 a.m. The tryst that night was to be opposite the bluff called Hashm Husaini (nose of a fox), but we were not fated to reach it until April 2, for neither the land nor the sea party knew exactly where it was. The country bore a monotonous resemblance to that of the day before. Behind us the headland Ras Umm al Awa could be seen running out north-east-by-east in a rocky point nearly reaching Zakhuniya Island. The south end of the island is still nearer to the north point of the next promontory of Udhaim, with a narrow channel only $4\frac{1}{2}$ feet deep between. As usual we stopped an hour or so after the start, for prayers and coffee, when the camels invariably strayed away and it required a long tramp to recapture them. During the halt Salem, one of the soldiers, discovered what he said was the footprint of a Hare. In great excitement he asked for my twelve-bore to be loaded and placed at full cock, and with relief I saw the tracker withdraw beyond effective range of the party. He failed, however, to find the Hare. But on resuming the march Salem and another man were sent to make a detour to wells reputed to be situated near Jabal Umm Uwaidh, and if the search were successful to bring the replenished skins to our next evening camp. We had scarcely parted from them when a rifle-shot rang out and Salem was seen approaching on a galloping camel with the Hare that he had shot on the run from a moving saddle. It was a small pale specimen, and the skin was preserved. It proved to be of a new race, and has been named *Lepus omanensis cheesmani* by Mr. Oldfield Thomas.

We had been led some distance westward and away from the coast by an arm of the sea, and, having reached its southern end, crossed some soft salt marshland. The men were very careful not to allow the camels to drink the sea-water, as they seemed inclined to do. We regained

the coast by crossing a ridge of sand-hills, and scanned the sea for the sail of the baghala. It was nowhere to be seen, and we had no idea whether it was behind or in front of us. The hills of Qatar across the bay of Salwa became visible for the first time from this point. The whole day we silently travelled along the white sandy shore, occasionally looking behind for the missing Ahmad and his boat. A Crested Grebe (*Podiceps cristatus*) in perfect breeding plumage was lying dead among the sea-wrack. At 4.30 we halted to examine an old camping-ground indicated by the droppings of sheep, and decided that wells were in the vicinity. Two were soon discovered, mere round pits roughly dug twelve feet down into darkness. One man was let down by a rope to investigate. The first well proved dry and the second contained a very little muddy water, which he tasted and pronounced sweet. The ridge here was littered with slabs of crystal gypsum like blocks of white marble. The gypsum ridge came from the westward and ended at the sea.

Muhammad now thought that if we continued the journey, and Allah willed, we should find the baghala; but as the sun was low I decided to camp. A little tent was erected, and bread was baked by making crushed wheat into dough and burying it in the sand under a fire. The resulting bread was very solid with a liberal mixture of sand. This, with a few dates, made the evening meal.

Just before twilight a pale example of the Desert Lark (*Ammomanes*) was seen feeding. I had just sufficient energy left to stalk and shoot it. It would probably prove to belong to a new race, but unfortunately it was the only one obtained or seen.¹ A party of Pallid Swifts (*Micropus murinus*) had been passed during the day, flying north-west up the coast. The only other birds observed were the Common Bee-eater, Pallid Harrier, Crested Lark, and Blue-headed Wagtail.

Some time after nightfall the two men came in with full

¹ Now named *Ammomanes deserti azizi*. See Appendix II.

water-skins and brought the news that the baghala was anchored about four miles ahead. We were astir early next morning and found the baghala after an hour's march. I went aboard and wound the chronometer. Ahmad was very apologetic for leaving us behind. He had found a favourable wind, and had rushed down regardless of his instructions to keep us in sight. I threatened that he should travel on a camel next day and learn to keep a better watch.

A Flamingo flying along the shore amazed the camel party. The crew did some successful fishing by an unusual and exciting method. The sea was shallow, and the water as clear as glass; the white sand at the bottom showed up the fish. The men with oars and poles approached a shoal with the rowing-boat and drove the fish close to the shore; then they leapt into the water and battered them over the heads with the sticks amid much yelling and splashing. Two handsomely spotted rock-cod were bagged, weighing about 8 lbs. each, and seven deep-keeled fish of 5 to 6 lbs. These are of a lovely Prussian blue, with a pale yellow patch a foot square across the back. Both kinds are excellent to eat.

The camels were given water for the first time since leaving Oqair. On resuming the march we soon left the higher headland of gypsum and crossed a succession of coral sand bays and sand-dune headlands. Once more parties of migrating Swifts, Chimney Swallows, and Tawny Pipits were noted, while an exhausted White Wagtail was caught on the baghala. Our objective was a headland which was visible to our southward. Ahmad at first said this was the elusive Hashm Husaini, but on arrival altered it to Huwaiqil (pronounced Hawaijil). Every time he corrected the names of his landmarks it necessitated my altering all my notes and observations.

The baghala anchored for the night on the south side of the headland Huwaiqil, a quarter of a mile from the shore, in the deepest water so far met with on the journey. The

little boat came up on to the sandy shore for the first and only time. This bay is renowned in Bahrain for its fire-wood, deep water, and shelter from a northerly gale. Dwarf tamarisk (*Tamarix mannifera*, Arabic "Tarfa") grows here among the rounded sugar-loaf mounds of light sand, and gives a peculiar pin-cushion effect to the landscape. I caught two Agama Lizards. When held in the hand they assume brilliant colours; the throat goes purple, the body and head azure blue, and the tail vermilion, but in spirit this all fades to the normal sandy colour.

The camel party tasted fish here for the first time, having first refused the present of an uncooked cod, saying they would prefer to eat a snake. Apparently, never having seen fish, they were unaware whether in the strict interpretation of the Quran it would be forbidden or allowed. Ahmad then presented them with a bowl of cooked fish when they arrived hungry. After an argument Muhammad Hasan started cautiously, and soon the whole of the Ikhwan were chancing their hopes of salvation. On subsequent days they never ceased to ask for more fish.

Reaching Hashm Husaini had become a standing joke among the men, but Ahmad promised that we should see it without fail on the morrow. At 6 a.m. on April 2 there was a fresh wind from the north and the sky was completely overcast, but the temperature was 78°. Hashm Husaini was definitely located a few miles inland. It is a bluff at the end of a sandstone range, rising to about 300 feet above sea-level. It certainly bears a strong resemblance to a fox's nose, as its name implies, and is a conspicuous point from land or sea. Our general course was, as before, south-south-east. We passed a succession of bays varied by a small inland sea with a narrow inlet, which Ahmad said was Dohat Hamar. After this the bays gave way to a stretch of straight coast, and our evening anchorage was exposed to the north wind. There was only four feet of water half a mile from the shore, and as our baghala ate four feet—as Ahmad put it—he could sail no

nearer. Even the rowing-boat stuck 200 yards out in a foot of water. We were tossing all night in the swell, and the baghala seemed to be turning somersaults at the end of the anchor rope.

We had passed during the day a small caravan of badawin with one donkey, two camels, and a few sheep, travelling northwards; they kept well away to our westward, and doubtless were watching us as closely as our camel party watched them. They were said to be on the Hasa-Qatar caravan route. Some fresh species of birds were noted, doubtless all migrants: Red-throated Pipit in breeding plumage, Yellow Wagtails, Crag-Martins (*Ptyonoprogne rupestris*), Chiff-chaff, and Sand Martins; and we moved two Hares.

On April 3 the north wind had dropped slightly, but the boat was still rolling, and I was glad to get ashore. There was still enough cloud to set me wondering what chance there would be of getting sun observations at Salwa, which was estimated to be at three hours' march from our camp. On passing the first headland Muhammad Asahali pointed to some blurred objects on the horizon which he said were the palm trees of Salwa. To our westward were numerous hills and ranges of about 300 feet, to which Ahmad gave the general name of Jabal Skhul, which was confirmed by the camel party. I had adopted the rule of accepting only names on which both parties had agreed. Between the hills and the sea was a plain two or three miles wide, through the middle of which ran the Hasa-Qatar caravan route. We came in sight of twenty camels advancing along this line in the direction of Hufuf. The party was friendly, engaged in trade with the Hasa. We stopped beside a small clump of wild date-palms, the only one on the western shores of the bay, in fact the only landmark. I took bearings with the compass on several clumps of palms on the eastern shore across the sea, now narrowing down to a sharp angle to our south.

There was no well near the palms, but a Hyæna's earth was established in the bushes and very recent footmarks indicated his presence. As the southern apex of the bay was one of the possible estuaries of the Wadi Sahba, I particularly examined it in passing for fresh-water shells, fossils, or any alluvial formation, but found only coral and marine shells. The plain stretching to the southward meets ranges of hills and valleys at a distance of four miles, and has the appearance and general formation of an estuary. On turning northward and eastward we passed from the western to the eastern shore by stepping over the tapering sea, here only a yard wide. We made straight for the first group of palms on the east coast, 300 yards from the sea: bushy palms about twelve feet high, with light sand accumulated round them. Only a few get away from the rest and grow to shapely trees of thirty feet in height. There was no indication that even these ever bear fruit. Although most patches have no wells, it is probable that fresh water could be found near the surface in any of them, and that their roots are actually in contact with it. The second knoll of palms was passed on our left, and we headed straight for the third, $1\frac{1}{2}$ miles inland, where there were four wells. We couched the camels under the shade and prepared to camp.

Muhammad mysteriously led me by the hand to where, a few hundred yards on the other side of the trees, lay the ruins. They were bigger than I expected from recent reports, but certainly did not suggest the remains of a large town such as Gerra might have been. They proved to be the outline of a spacious castle with rectangular walls, 95 yards by 71 yards, enclosing a courtyard (Plate 8). The walls were originally 6 feet thick, built of slabs of shell-covered rock, well cemented where protected, but mostly strewn helter-skelter about the base. The tower and inner castle were plainly traceable, the walls being still 4 feet and the tower 12 feet high, but now only a tumbled mound of loose slabs. A well in the larger courtyard was paved all

round with rock, and the sides were cemented masonry in good preservation. A few pieces of pottery, alabaster, and the broken shell of an ostrich egg were found, and similar relics were discovered two to three feet below the surface.

These objects were sent to Dr. Hogarth, who kindly reported on them as follows:—"The pottery, porcelain, and glass, including the bits of bangles, all look, so far as they are distinctive at all, like a settlement of Post-Islamic Arabs who had commercial relations with the Persian shore of the Gulf. The settlement might go back to the Kindi epoch, say sixth century A.D., but the stuff looks to me later than that. . . . Your description of the ruins certainly suggests merely a watering-place and scala. But of course Gerra may well have been no more than that."

A party of Arabs came in to the wells with twelve camels. Having sold their loads of fat (*dihin*) in Qatar, they were now on the return journey to Hasa with trade goods. Two were from Anaiza and four from the South. They all joined us for coffee and an exchange of news. Muhammad Asahali did not think much of Qatar people, and expressed his disapproval by taking imaginary dust in his hand and throwing it away.

By camel, Salwa is three days' journey from Qatar and four from Hasa. The wells, six feet deep, are not sweet-smelling, and have a slight incrustation of salt round the sides near the water, but we drank from them freely during our stay without ill effects. No one attempts to keep them clean, and we found a dead seagull in one and a camel's corpse close to another. A short shower of rain fell at 7 p.m. in the evening. A pair of Ravens (*Corvus corax ruficollis*) were constantly round the camp, and several Bifasciated Larks were identified in the neighbourhood.

Both sea and land parties were anxious to depart now Salwa had been reached, but for the following day a circular tour of five miles' radius had been planned, to see if there were any outlying ruins nearer the hills.

The shade temperature at 6.30 a.m. on April 4 was 79°.



5 THE RUINED CASTLE AT SALWA



9 SOUTH OF SALWA, BY THE SANDSTONE HILLS RUNNING NORTHWARD INTO QALAI



10 NEHDI WITH THE THEODOLITE ON THE SHORE AT SALWA

at 5 p.m. 95°. The sea was calm and the sun shone at rising, but when I had intended to get a meridian altitude it was obscured by cloud. The camels arrived on the shore at 7.45 a.m., and we marched eastward along the sea-coast. After a quarter of an hour Muhammad called, "Look, another castle." We had stumbled on a small square ruin, of much the same slabs of rock as the larger one, which from here lay $1\frac{1}{2}$ miles inland at a bearing of 172°. They are probably of the same period, the smaller being a coastal defence post. The camels were couched for a closer examination, and we discovered a few pieces of broken pottery and bracelets.

My expectations of finding the remains of a large city were now rising. We went a little further along the coast. At three miles from our starting-point we turned inland on a course due south, crossed the Qatar-Salwa caravan track, and struck across a white sandy plain towards a range of yellow sandstone hills that run three miles south of Salwa wells (Plate 9). A rough estimate of their height is 300 feet. We stopped in another small oasis of wild palms at their northern base to brew coffee and make observations. The men had gradually become accustomed to the instruments, and had all looked through the theodolite and prismatic compass, and they said they preferred the field-glasses. I had explained that the former had been brought specially to discover ruins. On our resuming the march a silvery-coated Fox was roused from some palm bushes, but was gone before rifles could be snatched from the saddle-bags. We returned to Salwa wells without any further discoveries.

The wind had been blowing from the south, which was favourable for Bahrain, and Ahmad continually worried to be making a start. Food and water were getting scarce, and he did not want to fill his tanks from these wells. It was necessary to arrange to depart the following day, whether I had been able to observe the sun or not; but for the sake of peace I told him to go on at once and leave me

behind, which had the desired effect. At 1 p.m. the sun appeared, and we returned to the boat to get out the theodolite (Plate 10). There was scarcely time to take two readings when the sun clouded over for the rest of the day. Having brought two heavy instruments all that distance, and hired a boat especially for their conveyance, I felt that this was maddening ill-luck. Even a complete round of angles to various points was defeated by mirage and refraction. Having marked the site of the theodolite, we returned to the baghala for the night. A hot evening followed, and a dead calm. Salem had borrowed my twelve-bore to lie up for a bird he called a *Kurwan*, which came regularly to drink at one of the wells. They now brought it to me, and it proved to be a pale race of Norfolk Plover,¹ which they also named *Ibn Houbara* (son of a bustard).

On April 5, at 7.30 a.m., we went ashore and took observations for azimuth, longitude, and time with the theodolite, but any idea of staying for an afternoon set had to be abandoned. At eleven the camel party came to say farewell and departed direct for Hufuf. At dawn we had found ourselves only just afloat with barely four feet of water, where the baghala had been anchored a quarter of a mile from the Salwa shore. She had to be poled into deeper water, guided by a man walking in front on the sea-bottom. After sailing a mile we were in twelve feet of water. A boat drawing more than four feet should not approach Salwa wells, but should keep towards the Qatar coast, that is, to the eastward of the centre of Dohat Salwa. At noon up went the sail, and although the fates had sent a northerly wind, we were able to tack against it towards Qatar, keeping a course parallel with the coast about a quarter of a mile from the shore. This and many subsequent tacks enabled me to gain a good idea of the features of the eastern side of the bay. At first the shore is low, with sand-hills in the background, but further north

¹ See Appendix II.

the hills and shore meet, and continue to run up northwards in close proximity. The depth of the sea is not great anywhere.

On the return passage we saw again the hills and headlands located on the journey down, and roughly checked their positions. Hashm Husaini, although actually the third range of hills northward from Salwa, is the first named hill.

At 3 p.m. we were caught on the Qatar side by a high north wind, the dreaded "shāmāl." The boat sped before the gale, looking for a sheltered bay, but the Qatar coast seemed here to be quite straight; it certainly was so wherever we saw it during the next two days. The anchor was cast a little way out at sea to weather out the storm. Ahmad did not know this coast and said it had never been surveyed. We hoped the wind would abate at sundown, but it blew hard all night. It was wonderful to see Ahmad standing erect to say the "Call to prayer" while the boat was reeling at all angles.

Next day the wind had subsided sufficiently to allow us to leave our anchorage, and till sunset we crossed and recrossed the sea, finally anchoring for the night close up to the northern shore of Dohat Huwaiqil, where we had camped on our journey down. We had here the deepest water we found. Ahmad estimated it at twenty feet, and I could not see the bottom or touch it with a pole. The place was also well sheltered from the north, but the wind dropped completely soon after the sail had been lowered.

During the day we had passed within a quarter of a mile south of Anaibar Island. It is about an acre in extent, composed of yellow-white sandstone, bare of vegetation, and about eight feet above sea-level in the centre. It was covered with Socotra Cormorants, and the fishy smell of the birds was noticeable at a distance of half a mile. At a point a quarter of a mile to the south-west of the island is a rock about a foot under water, over which the waves

were breaking as we passed. I took a reading of 40° when the rock and island came in line. Here the Qatar coast is a sandy shore; scrub grows close to the sea and across one to two miles of undulating sand-dunes until the hills are reached, which appear featureless and level-topped, running parallel with the coast and rising from 200 to 300 feet. Dohat Salwa is about eight miles wide, and from the middle both coasts were plainly visible.

April 7 found us lying becalmed in Dohat Huwaiqil. The sail had been raised at 3 a.m. to catch a small breeze which arose, but it had been hanging limply ever since. By the afternoon we had drifted about half-way between Umm Uwaidh and the Qatar coast. The sea seemed still not much more than eight miles wide. Occasionally the lazy flop of a porpoise broke the silence out at sea. Once a shoal of small feeding fish swirled up the water and attracted some Terns apparently from nowhere, but they kept just out of reach of my gun. Beyond these some Slender-billed Gulls (*Larus gelastes*) were the only living things seen during the day.

At 5 p.m. we began to move with an east wind, and at six this was still blowing and we were running northwards up the middle of the sea. Zakhuniya Island was passed (out of sight) at twilight, and we were expecting to be in Bahrain early the following morning. The crew were in excellent spirits at the altered prospects. At 10.30 p.m. I was lying on my blankets looking at the Great Bear and thinking things might be worse, while the boat was cleaving the waves as she bounded along. Suddenly there was a cry of "Land ahead!" and the sail was fetched down helter-skelter. Ahmad did not exactly know where he was, but thought it was Ras al Bahr, the southern point of Bahrain Island. He would not risk any further sailing in the dark, and we lay-to at anchor to await dawn.

Daylight showed that we had been heading straight for Ras al Bahr, and had only just discovered it in time. It

is a low sandy headland, fading by a gradual slope southwards into the sea. Luckily the east wind was still blowing and enabled us to continue a course up the west coast; and by tacking along the northern coast the jetty at Menama in Bahrain harbour was reached that afternoon.

CHAPTER V

OQAIR SANDS

So much for my brief expedition of 1921. It will now be realised that my eventual discovery of the ruins at Oqair in 1923 caused me no little satisfaction.

On my return from the ruin-field to the Fort, I got out the theodolite and, as soon as darkness had fallen, took observations on Vega and Aldebaran for longitude and Polaris for latitude. The Pole-star is fairly low, but the Arabian sky is wonderfully clear, and nowhere can the stars look so magnificent as here; even from the moment of rising the smaller stars are plainly visible, and Sirius assumes the proportions and brilliance of a little sun.

The time spent on the ruins had rather curtailed the day's hunting. I had secured three Bifasciated Larks (*Alæmon*), which had to be skinned after the instrument had been put away, and had noted in addition a Bartailed Godwit and Reef Heron on the shore and Large Sand Plover, Crested Lark, and White Wagtail along the sands. A room had been allotted to me in the Fort, but I had meals with Khalil Effendi, the Revenue Mamur. Next morning, November 18, after a somewhat chilly night, the thermometer read 60° at sunrise, advancing during the morning to 78° in the shade at noon. We were up betimes after a breakfast of fresh milk and Hasa dates of the year. The greater part of the day was devoted to getting the theodolite ready and all adjustments in order. It is surprising, when all the side-issues attending astronomical work are attended to, how little of the day is left for anything else. I also boiled some

water in the hypsometer and took the temperature in order to get a standard sea-level for the rest of my journey.

During a short walk along the shore six Flamingoes were seen standing out in the shallow sea, also one Sand Martin catching a few flies round the buildings ere he sped southward on migration. Other migrants seen were Isabelline Wheatear, Blue Rock Thrush, and Corn Bunting, with three kinds of Pipit—Meadow, Tawny, and Red-throated—and two Desert or Brown-necked Ravens. These are usually in pairs, and in the distance are difficult to distinguish from Rooks.

As I was returning along the sands to the southward of the Fort and just above high-water mark (Plate 7), I noticed a peculiar whistling noise issuing from the ground around. Every step brought forth a response in the form of a thin, high-pitched piping, lasting about five seconds, and apparently at a distance of five to twenty paces. The first time I had heard a similar sound was in the courtyard of Ashar Barracks, Basra, during the early days of the war, and I had then tried to locate the sound without success. Mole-crickets were very plentiful at that time in Basra, and the sound had always thereafter been associated in my own mind with these insects. It seemed possible it might be their warning note, or that of some ventriloquial insect, as they heard my footsteps and hurried underground. At Oqair I made a determined attempt to solve the mystery, and for about an hour travelled hither and thither following the elusive note, but could find no clue and could not even be sure of the exact direction from which it came. First it would seem to be twenty paces in front, then as I moved forward it would burst forth five paces behind, and then to the side and so on, until, hot and defeated, I had to hurry back to the theodolite.

It was not till I arrived in England and read Lord Curzon's *Tales of Travel*, which devoted a whole chapter

to the Sounding Sand-dunes and Musical Beaches, previously grouped together as Singing Sands, that I realised that I had encountered the phenomenon of the Musical Beach. Had I had the advantage of the information on the subject contained in that work beforehand, my investigations would have been approached from another standpoint, with the idea that the origin of the sounds is as likely to be mechanical as entomological. The sound said to be given out by sand-dunes of a certain shape I did not hear or hear of in the deserts I passed through. The best description of the sound as I heard it is that of Thoreau, who visited a famous beach at Manchester-by-Sea, Mass., in 1858. He says "The sound was not at all musical nor was it loud. R., who had not heard it, was about right when he said it was like that made by rubbing wet glass with your finger. I thought it as much like the sound made by waxing a table as anything."

As I sat in the Fort in Oqair that evening on a terrace that overlooked the sands, I could still hear the mysterious sound, although apparently all was still and there was no vibration to cause it. My diary records the event in these words: "After a sunny day the evening is cool and windless, the crickets in the ground are singing all round, and a bright moon is reflected on the sea."

CHAPTER VI

HUFUF ROAD

ON November 19 we left Oqair at sunrise to cross the forty miles of soft sand-dunes to Jisha, the first village in the Hasa oasis. This is considered the best arrangement, as it leaves only a two hours' march into Hufuf the next day, and it is much easier for your host to time your official reception so that the room may be full of people and the ceremony be more impressive. Six dhaluls or riding-camels had been sent, and though the party of two soldiers and Mehdi besides myself only required four, there was no question of perpetrating such an indignity on the other two as that of loading some of the kit on them. They were therefore led unladen by the head-ropes, while seven of the white Hasa donkeys were engaged in the transport of the boxes. The weight, size, and shape of these had not been selected with a view to convenience of loading on pack-animals. Each donkey was allotted two packages, and a more unmanageable string of beasts than these as they banged and jostled each other when passing through the Fort gates I never saw, and all Oqair had risen early to see the start. As we breasted the first sandhills and looked back north-eastward, the top of Jabal Dukhan on Bahrain Island appeared above the horizon of the sea, the base itself cut off by mirage. By all the laws it should have been out of sight below the horizon, but through one of the curious freaks of refraction so often noticed in these parts it was standing out clearly and inviting the taking of a compass-bearing, which I was very glad to get. Jabal Dukhan has been astronomically fixed by naval surveys, and this ray enabled

me to connect and check my mapping with one accurate position situated in the rest of the known world that I had left behind.

The sand-dune country makes dreary marching; road there is none. Hour after hour we wound round about sand-hills, keeping more or less to the trough and making a course a little south of west. The dunes lie eastward and westward, the sides are at a gentle incline on the north and steep to the south, indicating that the prevailing wind is from the north and that they are moving steadily southward. Our first rest was at Umm al Dharr, where sweet water can be obtained at three or four feet by scratching away the sand. The donkeys had preceded us and had already had their fill when we arrived; at their usual tripping gait they cover the ground at about five miles an hour, and the donkey-men, who seldom ride, have to run most of the way to keep up. We were only allowed thirty-five minutes, during which the coffee-pot was boiled and the brew handed round. The food, consisting merely of dates and unleavened bread, did not occupy much time. Fuel was scarce here, as it was likely to be where many caravans halt daily. The few shrubs there were had a very ill-treated appearance. There was one shrub that deserves notice, ten feet high. It is called *Ashurr* by the Arabs, and scientifically *Calotropis procera* (Plate 12); its large green leaves and clusters of purple blooms are an unexpected sight in a sand-dune desert, and it would seem more suitable for a tropical jungle. The bark is thickly coated with ribs of cork, and when the stem is cut, a white sticky juice flows out. Still more remarkable is the large green kidney-shaped fruit-pod. I managed to secure specimens, but experienced much difficulty in drying them. It was probably a month before they were packed away from air, and even then they were found to be mildewed on examination. The same trouble occurred in the case of the fleshy-leaved *Suaeda* and other salt bushes and the broom rape; but my book of blotting-



IT ON THE LEFT, ' FARIBUTH ', ON THE RIGHT, "DHANUN"



12 "ASHURR" BUSH AT UMM AL DHARR

paper sheets worked well enough for other botanical specimens.

About an hour's march from here we looked back and obtained a last view of the sea from a place called Qahdiya. The sea, fifteen miles distant, was a dim blue line, and in between were the indistinct ridges of the wearisome dunes we had passed. Imperceptibly we had been rising steadily until we stood on the highest land between Hufuf and the sea. For the rest of the journey there was an equally unnoticeable descent. Said, the oldest of the soldiers, was in charge, and was anxious to keep on the trot and force the pace, while I for my own comfort was determined not to do so. Once my camel shot forward unexpectedly when Said was behind me, and showed an undue anxiety to break into a jog-trot. Next time he came behind I turned suddenly and caught him in the act of giving my mount a sly dig with his camel-stick. This could not be allowed; so with a good deal of parade, the camel's head-rope was pulled till its pace was reduced to a mere crawl. Occasionally when the going was good I got it into a trot, but was very glad to let it walk again; a camel trot is a most uncomfortable gait, and makes even an Arab look an undignified sight, bumping along and looking anything but gummed on his saddle.

A short halt was made after seven hours' hard going, while the men prayed and I walked about and wondered how stiff I should be when it came to mounting next morning. We had six miles of flat salt plain, across which we trotted, and then more sand-hills before coming at last in view of the Hasa oasis.

In addition to the feeling of intense relief after being for so many hours restricted in vision to the next yellow dune about 400 yards off in any direction, the first glimpse across the Hasa oasis strikes one as being really beautiful. There is a distant view of three or four dark ranges of hills rising out of the plain, each a mile or so in length and about 300 feet above ground level. Jabal Arba, the

most southerly, has four rock pimples in line, all entirely separate from each other and from the hill itself. Jabal Qara is to the north and had previously been brought to my notice, as Burckhardt, the German traveller, visited and described the caves in this hill in 1904. Between the hills was the dark patch familiar in desert scenery as the clear-cut outline of cultivation, the date-palm groves of an oasis. At first sight it would seem an easy district to map with simple instruments such as a prismatic compass. The hills are conspicuous landmarks and situated at all points of the compass, and the cross-bearings from three or four would give their position with great accuracy; but the difficulty begins when you try to get the lie of the villages and the maze of paths through the gardens. The villages are so hemmed in by tall trees that nothing can be seen of the hills from them, and the conditions become those of a tropical jungle country. The detail on Hasa maps had hitherto been filled in by the timing of the route-marches of the few travellers who had passed through, and by their notes; consequently I found that even these conspicuous hills were marked as being very far from their real position, and some were missed out altogether. Mapping the Hasa oasis was not, however, part of my programme. I did not wish to show too much zeal in this, a comparatively accessible country, and spoil my chance of being allowed to take my instruments further afield.

Jisha lies to the eastern extremity of the oasis, and the village is just outside the palms. We arrived at the house of the Amir after exactly ten hours' strenuous trekking, at least one of the party being tired in mind and even more so in limb. The distance was subsequently calculated to be thirty-seven and a half miles, covered at a rate of 3·9 miles per hour after the time spent on halts had been deducted. The Amir, who had had notice of our coming, had tea and coffee in readiness, and I left him in no doubt of my opinion as to the excellence of both. Roast

lamb, head and tail complete on a pile of boiled rice, and a few side-dishes followed quickly without the usual long delay while the lamb is being chased, killed, and cooked—a drawback in the case of most Arab entertainments.

The Amir was a peppery old man and gave his orders to his servants, one a picturesque figure with long black curls, in an irritable voice. He sat beside me while I ate in solitary state, and joined the rest of the party outside when the dishes were removed. It was seldom during the whole of my stay in Arabia that I ate with my hosts or with the rest of the company, although they would often join me afterwards for coffee. This was not, as might be imagined, because they had an objection to eating with an infidel, but from a desire to show the greatest respect to the Sultan's guest. The guest-room is spacious for an Arab building, 18 feet wide by 30 feet long. The big expanse of flat roof is carried by three spans of long palm-logs lying parallel with the longest side, supported at their butt-ends by two limestone arches grafted on the masonry walls (and not held up from the ground or by means of buttresses), which arch over the width of the room with a monasterial effect. Most Arab rooms are restricted in breadth to the length of single palm-logs, which are laid side by side from wall-plate to wall-plate to carry the roof. We were now in a land where the arch plays an important part in architecture, although the type may be somewhat primitive. Some of the arches in the courtyard supporting a veranda reminded me of English arches of the Norman period. Building material is close at hand, as, in addition to the resources of the chalky sandstone hills, good blocks of white stone can be quarried anywhere on the plain.

Quiet soon reigned over the village, unbroken except by a pack of Jackals, the first mammals to be noted in the oasis. Their appearance rather surprised me, as they do not care for the desert unless within visiting distance of towns in a night's ramble. The first pair to arrive in

Hufuf must have traversed 400 miles of uncongenial waterless country, but they were well rewarded, for once they had found the oasis it would be difficult to imagine a more desirable place to settle in—unlimited shady palms above, green lucerne beds below, in which to lie during the day, and villages to haunt at night with weird yelps and blood-curdling whines expressive of delight at the prospect of a raid in search of bones on the day's accumulation in the local rubbish-heaps.

Next morning, soon after sunrise, we walked through the village and mounted the camels outside the walls, as the lintel of the gateway was only just high enough for a camel and rider to pass under. The donkeys had gone on ahead, starting as soon as I released my camp-bed for them to carry. The stiffness of the previous day's ride was most acute on the muscles of the thigh, where the leg had rubbed against the wooden upright of the front pommel, round which it is hooked, with the other leg supported on the instep, badawin fashion, so that the limbs are very much in the same position as those of a woman riding on an English side-saddle.

We were immediately engulfed in the palm-groves. Well-tended gardens surrounded us. Tall date-palms told of the fertility of the land once it had the necessary water, and here it had plenty. Most of the land below the palms was bright with the fresh green of lucerne. After the first few miles the agricultural mind begins to wonder what can devour such huge quantities of lucerne. The answer is not apparent until you have travelled about the roads of Hufuf and the main routes around the oasis; only then do you realise that wherever you go there is one continual stream of white donkeys—donkeys loaded with trade goods from Oqair, donkeys bringing scrub firewood from the desert, strings of donkeys loaded with blocks of chalky stone from the quarries and going to the builder in the village, guided by a small urchin seated on the hindermost inches of the hindermost donkey. On

the return journey, unloaded, this cavalcade travels down the narrow streets at a hand gallop; sailing directions from the merry imp at the back, bumping high into the air at each stride of his mount, but by some capillary attraction—it is beyond the scope of poise or balance—returning to the same spot each time, are telephoned to the leader in a string of oaths. “Hike!” they call in a high-pitched voice, drawing in a long breath; then follows a gabble of the curses considered to have the most goading qualities, continuing as long as the breath shall endure, so that the last are mere incoherent gaspings. The words may be varied, but the preliminary “Hike!” and the form of delivery never change; the call of the donkey-boys is therefore one of the lasting impressions of the Hasa. Then there are the more sedate donkeys of the merchants going smoothly along to market at a gait of six to seven miles an hour, recognisable by their more costly trappings; and thousands more that hour after hour run up and down the inclined plane of the water-lifts to the accompaniment of the song of the man who directs them and the splash of the great water-skins as they discharge their contents into the troughs at the termination of each run. All these donkeys eat nothing but lucerne and dates the whole year through. The desert outside provides nothing that can be counted on as animal food, unless you go where the badawin and their camels are, three or four days’ journey away. There are few horses in Hufuf, excepting those considered as Government remounts in the Governor’s stables; and a few thin, humped cattle are kept for fresh milk. These, and even the camels that live in the town, are entirely dependent on green lucerne and dates for food. Accordingly, if asked what were the two key industries of Hufuf, I should say, dates, with lucerne a good second.

The first impressions of the oasis were pleasant enough. Said had evidently promised to land me at the Governor’s door at a certain time, and was as anxious to hurry us on

as I was determined to go slowly and enjoy the scenery. We effected a compromise by trotting over the bare sandstone places through which our road led us, whereas along the garden paths we walked the whole distance. Some of the gardens grew lime and orange trees with dates overhead. Strange to say, the orange crop was over in the middle of November, while in Iraq they would be just beginning to gather the earliest fruit—a difference of two months for which I have no explanation, although a fortnight for dissimilarity in climate and latitude would not have been surprising. Preparation for wheat cultivation was in progress on small patches of land outside the palm area where a maximum of sunshine is obtained. In the shade of the palms the straw is thin, and only grain of second quality can be grown. The ground was being chopped by hand with an instrument like a spade with a handle like that of a hoe. Ploughs are unknown in Hasa. A surprisingly small area is put under wheat, considering that barley is not grown, one reason being that the plain is far from level, and flats suitable for irrigation are difficult to bring under water; and when expense is incurred it pays better to grow lucerne, rice, or oranges, with dates overhead, that is, two crops in the year, than to be limited to one crop of wheat, which does not flourish under palms. Sowing of wheat takes place immediately after the ground is broken up, and water is then run over it. As these wheats were in ear on February 4, the harvest would be about the middle of March, a month to five weeks earlier than in Iraq, although sowings in the two countries are made more or less at the same time. *Bur* is the name used in speaking of corn generally.

A greater contrast to the desert outside even than the vegetation is provided by the water flowing on one side, sometimes on both sides, of the paths, and underneath bridges and culverts of rough masonry, with maidenhair ferns growing in the crevices—not sluggish streamlets,

but crystal-clear brooks, with the current and volume of an English mill-race ! The arteries of the oasis nearer the source, before their waters are dissipated into the side-branches, are swirling rivers.

The question that had been uppermost in my mind since first I heard of the running streams of Hufuf was, Were there any fish in them ? It seemed very unlikely. But we had it on Palgrave's authority that fish and frogs abounded in the stream below the hot spring of Umm al Saba. My search of the pools at the base of cascades, and the clear unruffled parts of the streams where every stone at the bottom was visible as we rode along, was at last rewarded by the sight of shoals of small fish the size of minnows, and I even found myself looking for trout. The waters were ideal for them, and on several reaches a fly could have been got on ; but the marvels of the place did not extend thus far. Probably even if trout were introduced the tepid water would make conditions unsuitable, especially during the summer. This discovery offered prospects of fishing for specimens, to find what they were, up to what temperature they were able to exist, and how they got there. The first two problems were eventually solved, but the last remains still a mystery. The nearest fresh water is the Shatt al Arab, 400 miles away. The Hufuf springs are used up in the gardens, or pour into the sands just outside and disappear. All the streams, even those separated from the rest, contain the fish. Satisfactory explanations are not easy to find. There are two, which, however, are not convincing. Fish eggs may be brought on the feet or breasts of water-fowl, or they may travel from Najd from the mountain streams and come 150 miles underground with the water ; but we have no information that fish have ever been found in Najd. The whole question is discussed more fully in Appendix IV.

Two kinds of birds that were not seen in Oqair or on the desert road were seen in every garden that we passed—

the Wren Warbler (*Prinia gracilis hufufæ*) and the White-eared Bulbul (*Pycnonotus leucotis*). The Bulbul looked, and eventually proved to be, identical with that of Iraq, but the Wren Warbler on first acquaintance that morning seemed darker, with a longer tail and the dark spots on the end of the tail-feathers more conspicuous than on its northern neighbour. Very often slight differences of colour such as divide subspecies of birds well known to the observer are apparent to the eye when first seen in the field, whereas on comparison of single skins they are not obvious, and it is not until series of the skins are laid side by side that the racial separation noticed in the field can be confirmed. In this case and that of the House Sparrow, also seen in the gardens and villages for the first time, which seemed smaller and greyer than the House Sparrow of Iraq, the slight differences observed were confirmed later at the Museum. Differences of light and shade on plumage, however, are very deceptive, and it is unwise to place too much confidence in these field identifications.

Two villages named Jafar and Fudhul are passed close to the left of the Jisha-Hufuf path, and more than one elevated plain, one two miles across, is traversed, the ground being too high for irrigation. These were taken advantage of under the old military regime of the Turks, who erected mud and stone walled forts, and garrisoned them for the protection of the road. There is certainly a good field of fire, but under the present Sultan's Government such outposts are unnecessary, and the walls are falling into decay. One fort is used as a store, and I was told that there were some soldiers in it, but they were not in evidence.

CHAPTER VII

HUFUF TOWN

THE last chalky plain is that over which the houses of Hufuf and the dome and minaret of the mosque can be seen on the far or western side. It is a landscape of whites, as the chalky sandstone of the houses is the same colour as the country around, with a dark-green background of palms from a separate group of flowing wells to the north and west of the town. The Oqair Gate is the eastern entrance through the strong wall. It is also one of the busiest; a constant stream of donkeys loaded and unloaded was passing in and out as we approached. In close proximity to the town we found a graveyard and many rubbish-heaps, where town refuse is collected for distribution for manuring purposes. The cemetery was a series of mounds, slightly raised, with sometimes a slab of stone or a stick stuck at one end of the graves—an untidy, neglected place. As our camels arrived at the gate, Said tried to stop the donkeys, which are awkward to pass in a narrow portal when loaded. He shouted a warning through the gate when a funeral procession arrived, carrying the cloth-covered body at such a pace that the relatives, all men, were keeping up with difficulty, and even the corpse seemed to be having a rough passage. I thought Said was going to try to stop them until we passed, but with a bad grace he let them go and they hustled on without any respect to the dead being shown by bearers, mourners, or passers-by on either side. We then managed to get the way clear and rode through into a wide street, which compared with many other Arab towns was clean.

The houses are built of white sandstone blocks faced with sandstone mortar, with flat roofs of timber, and coated with mud. I saw no fire-baked brick buildings. There were several herds of cows, rather like Jerseys, humped and with long thin faces. They were wandering along untended, picking up orange-peel and scavenging as Eastern cows are wont to do, together with a flock of long-haired black sheep with fat tails, and herds of black goats. It takes more than a glance to distinguish which is which. Crossing the broad market at right angles, we entered one more gateway into the Citadel, a walled fortress within a walled town, another relic of the Turkish garrison, for it was in those days the cantonment barracks and official residence of the Ottoman Government. An attractive narrow street with coppersmiths' shops on both sides took us still further westward, and turning at last to the right we couched the camels at the door of the Governor's Palace, where several negro slaves in the uniform of the Shaikh were loitering.

Said was the first to dismount and, having hurriedly kissed everybody within reach, turned and helped me to disentangle myself from the saddle, and took me into the building. He had previously warned me not to smoke in the presence of the Governor or in the streets of Hufuf. We passed several courts and up a broad flight of stairs, each step guarded by more soldiers and slaves sitting one on each side. The large chamber at the top was crowded round the walls with soldiers and courtiers, each with a curved Arab sword with chased silver scabbard. At the far end of the room sat a short broad-shouldered Arab, Shaikh Abdulla ibn Jiluwi, Governor of the Hasa Province, and a cousin of the Sultan, a man in the late fifties. His face is only slightly more sallow in hue than a sunburnt Englishman's, and is lit with keen brown Arab eyes. Although somewhat austere, his features are pleasant and just miss being handsome. His dress was fine but severely simple, except that his sword had a scabbard of chased

gold. He was apparently discovered in the middle of the business of the day; nevertheless he rose to shake hands with me, placed me on a seat beside him, and with a word cleared the court of all but the soldiers. I was then introduced to a benevolent-looking old man, Muhammad Effendi, who was sitting on my left. He is paler even than the Governor, and is Revenue Collector, scribe, and general factotum of official Hasa. He is, moreover, a Turk, taken over by the present Government as a going concern, so to speak, when the Turkish garrison left, as he had the intricacies of tax-gathering and the general revenue matters of the Hasa at his finger-tips, and, having married locally, was quite content to be adopted. Apart from the younger generation of his own family, he would be a difficult man to replace from the Wahhabi ranks, in which two main classes exist: the Shaikh's families and other land-owning families, who, although educated, would look down on clerkship as servitude, and the fellahin or workers, who are illiterate. A member of the local merchant families could scarcely be sufficiently detached from his own affairs to make a satisfactory Government servant.

Shaikh Abdulla is first, last, and always a soldier. Discipline is in the atmosphere of his court; his staff are always on parade when in his company. It is not the ordered ritual of the European military system, but cast-iron discipline all the same. When he rises, the whole assembly rises with an accompanying clatter of swords. When he calls for coffee, the order is repeated by gruff voices down the room and relayed through the door, and you hear "Gahwa" repeated by the slaves on the stairs and fading down the corridors. The echo has scarcely died out in the distance when up comes the coffee. It never occurs to anyone to delay or to question an order of Shaikh Abdulla. The illustration of the coffee is a trifling instance, but it applies equally to the badawin accused of a breach of the tribal laws, or an act of pillage.

Although apparently safe in the fastnesses of his desert home, he mounts his camel on receiving an order and comes in to Hufuf for absolution or punishment. The secret of Shaikh Abdulla's hold over the wild tribesmen, some of whom have never been controlled before, is his wide reputation for justice and sympathy, combined with relentless punishment for the guilty. In no country does crime so swiftly meet with its just reward; there are no pleaders to throw dust in the eyes of the judicial authority on behalf of those who can afford to pay them. Moreover, the laws are simple to understand and to keep and are not oppressive. Another force which this remarkable man controls with much skill is the antagonism of townsman for badawin and badawin for townsman. Each regards the other as an inferior animal, and an incautious word from one in authority would send them at each other's throats and set the province in an uproar. A badawin told me that the Governor had a partiality for the town-dweller, and a townsman confided the news that he had a soft corner in his heart for the tribesman; and so he keeps the peace between two elements which are never likely to combine against the Government. The atmosphere is one in which politics and politicians do not thrive or even occur. It is all left to Allah and his representative, Ibn Saud the Imam.

Shaikh Abdulla, as the townsman and tribesman call the Governor with almost filial affection, asked politely after Sir Percy Cox and my own health, gave instructions to Muhammad Effendi to look after me during my stay, and after coffee told me of the guest-house which had been prepared for my reception. It is kept solely for the entertainment of the few European guests who visit the Hasa. I found Shaikh Abdulla somewhat difficult to understand, as his Arabic was the deep-throated purer language of the desert, whereas I could converse with ease with Muhammad Effendi, a native of Mosul, since his was a patois to which my ear had become accustomed in

Baghdad. In entering the crowded hall dressed in a Norfolk jacket, grey felt slouch hat, puttees and boots, to say nothing of a flourishing beard of four days' stubbly growth, I had felt much too conspicuous to be comfortable. The European practice of taking off the hat and retaining the boots, when the exact reverse is the polite custom of the country, is no more appreciated there than the manners of a guest would be who ceremoniously came barefooted into a London drawing-room and retained his hat. I determined to take an early opportunity to purchase some Arab clothes. Said, the soldier, brought Mehdi up and introduced him, and I explained that he was my servant; the Shaikh shook hands, and Mehdi then retired, while Said gave an account of our trapping and skinning operations in Oqair, in which his master was keenly interested. Tea was then brought, and Said was called again to show me to my house.

It was entered from a street mostly occupied by the shops of coffee-pot makers, and adjoined the Palace occupied by Ibn Saud when he is in Hufuf. There was the usual enclosed courtyard. On each side of the door was a spacious room; one was a coffee-dispensing chamber with a small hearth in the middle, in the other my boxes were already accumulating, and Mehdi had pegged out a claim in the corner. My quarters were the two upstairs rooms, approached by a sandstone staircase from the courtyard, and the broad veranda running the length of the house supported by a colonnade of sandstone arches. In one room, in which my camp-bed was already installed, the furniture consisted of a chair and two benches, a table, a glass toilet water-bottle, and a glass. The other room was arranged in Eastern style as a reception-room, the floor being covered with rugs and cushions ranged all round the room against the walls. The establishment consisted, in addition to two soldiers who slept down below and accompanied me when I walked abroad, of a superior servant who performed the rôle of butler,

another to fetch and carry, also a negro slave who kept the coffee arrangement always going, so that at any time during the day either hot tea or coffee was always on tap. Judging by the sounds of revelry below at all hours, and occasional whiffs of the forbidden weed, I think that many callers foregathered there to shelter under the general indulgence extended by the authorities to the infidel guest. Said warned me not to be seen smoking in the town and added : "The house is your own, you can do as you like within its walls."

At midday servants appeared from the kitchen of Muhammad Effendi bearing trays of dishes, boiled rice piled high, on which reclined two roast chickens, dishes of mutton-hash with ladies'-fingers and tomatoes, a heap of slabs of unleavened bread, poached eggs on a hash of spiced meat, and a dish of luscious Khelas dates. Seated on the floor in front of this modest pile, I ate in solitary grandeur and did my best to make a visible impression, dipping into soup and other elusive dishes with my hand, as, of course, the whole of Hufuf does not boast a knife and fork, although a spoon did on occasions put in an appearance. Outside, a servant in white *kaftiyya* (head-covering) and *zibun* (cloak) waited with towel and water-bowl and, to my surprise, a cake of Pears' soap, the whole reminding me of *The Jackdaw of Rheims*. He also sent Mehdi up to see if I had any clothes for the laundry, as a man was waiting to take them down to one of the hot springs and would bring them back clean and dry next day. This last was a welcome surprise, for in Basra and on the British India Company's steamer, even in these enlightened days, there are no regular arrangements by which a traveller can have his washing done, and my accumulation was a big one. The meals were repeated throughout my stay, with much the same menu, at midday and after the sunset prayer. In addition, soon after sunrise a breakfast was brought up, consisting of hard-boiled eggs, bread, and hot cow's milk.

After lunch on the day of arrival I announced to Said my intention of walking into the gardens with the .410 collecting gun to get some idea of the commoner birds of the country. He did not greet the announcement with any enthusiasm, and after saying I could not go out without him, left me with the excuse that he was going to find a boy to carry my small collecting-tin. Ever since our first meeting at Oqair, I realised that this half-breed negro would require delicate handling, and was prepared to see him attempt to control me to his own advantage, with the clumsy boorish cunning which is as much in the character of the nigger as it is foreign to the nature of the pure-bred Arab. The latter attempts to create a satisfactory situation without arousing the same resentment in the intended victim. I waited half an hour for Said, and as he did not arrive I called the other soldier away from the coffee-hearth and started, knowing full well that the delinquent would have to make haste to find me for fear it should be reported to the Governor that I had passed through the town without him.

It was a delightful hour we spent wandering among the palm-groves (Plate 13), and my short tour of inspection promised well for future collecting. The little fish were plentiful in all the streams, the mud walls round the lucerne fields were honeycombed with the holes of some animal; there were big and small butterflies, one I recognised as the Common Swallow-Tail and another even larger, the Lime Swallow-Tail, so slow in flight that I caught one in my hand as it glided past. Beyond the Bulbul and Wren Warbler, which were numerous, I saw no birds, and I began to realise that my bird collection was likely to consist of a very small number of different species. However, there was more than enough to occupy me for several weeks, and I began to wonder whether I should be moved off to Riyadh or even back to England without having time to get a representative collection from the oasis. On the return we picked up Said, who was watch-

ing both the northern entrances to the town in order to make an ostentatious passage through the streets in my company. He looked a little sheepish, but I said nothing, knowing that the tussle would commence when I began work in earnest. On entering the gate at the western end of the north wall, we passed directly into the Kut and crossed an open space where seventy or eighty beautiful Arab horses belonging to the Governor were tied to mangers, munching lucerne (Plate 14). They are kept in the open throughout the winter, but are placed under rough shelters of palm branches during the heat of summer. My first evening in Hufuf was spent in skinning five Wren Warblers and one Bulbul.



13 IN THE GARDENS, HILUJ — PALM TREES AND ZIZYPHUS
TREE (ON LEFT)



14 IBN JILUWI'S SIABLIS, HILUJ — THE MOSQUE OF IBRAHIM PASHA IN BACK-
GROUND.

CHAPTER VIII

PALGRAVE AND PHILBY

AFTER breakfast next morning, November 21, I read Philby's *Heart of Arabia*¹ to compare his account of the Hufuf oasis with that of Palgrave, and in the same volume re-read his criticism of Palgrave's narrative.² I had brought the volumes of both authors, and, having the advantage of being on the spot and holding a brief for neither, I thought it would be a good opportunity to sit in self-appointed judgment on the merits of the two. The day before, we had met with a string of camels tied head to tail coming through a narrow pathway in the palm-gardens, and had had some difficulty in passing them. The same kind of awkward squad was seen in Buraida by Palgrave, who describes it as "a whole string of camels, the head-rope of each tied to the crupper of his precursor, very uncomfortable passengers when met with at a narrow turning." Philby comments thus: "The practice of connecting the animals of a caravan in this manner is certainly not prevalent in Desert Arabia, and the only occasion I met with it during my sojourn in the country was on the road between Taif and Mecca in the Hijaz." This is a decided point to Palgrave, for on another occasion I passed a string of loaded camels tied exactly as he narrated, and when I spoke to one of the soldiers, Hasan, he said it was often to be seen and asked why I was interested. I told him, and he laughingly said, "Give my salam to 'Philbee' and say that there is nothing unusual in it." We can therefore assume that,

¹ *The Heart of Arabia*, H. St. J. B. Philby, 1922.

² *A Year's Journey through Central and Eastern Arabia*, W. G. Palgrave (1862-63), 1908.

as it is no uncommon practice in Hasa and the Hejaz, Palgrave did see it done in Buraida.

Philby also, with more courage than discretion, enters the arena on the question of the kind of corn grown in Hasa, and quotes Palgrave's statement that "almost all legumina and cerealia, barley excepted (at least I neither saw nor heard of any), cover the plain." Although the few words about the absence of barley are the only strictly accurate part of Palgrave's sentence, Philby directly contradicts it with the statement that "barley grows profusely." On inquiry I was told that the only barley that enters Hufuf is imported from overseas by the Governor for his horses, and I was able to confirm this by an examination of every field of growing corn we passed. In addition to noting the difference in the leaf bracts, which embrace the stem of barley and are absent in wheat, I used to make doubly sure by digging up the seed attached to the plant. It was invariably wheat, though in justice to Philby it is necessary to mention that there was one small patch of lucerne which had tufts of barley planted round the edge. Nevertheless, the harvest of this would no more than fill a bushel.

Although wheat is the only winter cereal grown, its cultivation cannot be considered extensive. The plots are small and indeed take a lot of finding, and the largest piece I saw in the whole oasis was about three acres, so that neither Palgrave's words, "cover the plain," nor Philby's "grows profusely" give a very accurate idea of the extent of winter corn-growing in the Hasa oasis.

Most of Palgrave's agriculture and horticulture is misleading, partly because he was not equipped with the necessary knowledge of the subject, and partly owing to sheer inaccuracy. An example of the latter is his mention of the animals used in Hufuf for ploughing. His words are: ". . . But I should not pass over in silence the increasing number of kine, all hunchbacked, Brahminee-bull fashion; they are often put to the plough, though

not exclusively, being at times replaced by asses; by horses, I need hardly say, never." Although this is not one of the statements challenged by Philby, it has rightly called forth a protest from Mr. J. B. Mackie (*Geographical Journal*, March 1924). For one of the peculiarities of the oasis is that ploughs are unknown, all the cultivation being carried out by hand, the land being chopped up by broad iron spades fixed to a wooden handle in the form of a hoe.

There are two plants given in Palgrave's list as occurring in the gardens, namely, the Papay tree and the Sugar-Cane, neither of which grows there, as Philby points out, but I think it can be explained that this error is not so preposterous as it at first appears. The castor-oil plant does grow there, and owing to similarity in shape of leaf, the blue-green colour of the foliage, and general appearance, it might easily be mistaken for the undergrown Papay tree which Palgrave says he observed. Again, the sugar-cane he saw being sold by retail in bundles in the market-place, from which purchasers take it home to gnaw at leisure in their houses, may well have been the succulent underground stem of a peculiar desert plant (*Cynomorium coccineum*) called *Tarthuth* (Plate 11). The stems are pinkish, are sold in baskets in the bazaar, and the purchasers walk about gnawing them as the natives of India do with sugar-cane, so that the mistake in identification would be excusable.

Palgrave says he saw buffaloes wallowing in the pools of Hasa, a statement which Philby ridicules and I have called a blazing indiscretion. He could not possibly have seen them, nor could anyone who had been in India, as he had, have mistaken domestic cattle for them. I asked among the soldiers and more particularly the garden-owners whether buffaloes had ever been imported. Some of them had seen them in Basra and in India, and there was no doubt about their verdict when they said that nobody had introduced or was likely to introduce

buffaloes into the Hasa, as the conditions would be quite unsuitable. The following, though not one of the cases disputed by Philby, is another instance of Palgrave's disregard of accuracy. It is in his description of his departure from Buraida by night when, apparently with the intention of impressing the reader with the author's intimate knowledge of astronomy, he says: "Canopus glittered in all his splendour to the South." (Canopus [Arabic, *Sohail*] is one of the most famous stars of the Arabs and is a favourite name given to their treasured falcons.) If he could have left the passage there, all would have been well, but, being Palgrave, he added: "and Orion was to rise before long." Had he studied a star-map, he would have seen that Orion is well up in the sky when Canopus rises.

Enough has been said to show that much of Palgrave's descriptive detail, given with impudent assurance, is quite unreliable. Philby has rightly challenged a great deal of his information, but in at least two instances in which Philby comes into conflict with Palgrave, I found that not only is the latter right, but Philby is wrong. On sifting the evidence I came to the conclusion that they both must have been in the Hasa. It is only too easy, however careful one may be, to fall into little inaccuracies in an endeavour to put colour into one's description of a country, and it is easier still, as I found, to come behind and point out the shortcomings of a predecessor. I feel sure that the man who follows me will need no microscope, if such be his desire. When Philby suggests that Palgrave never even went to the Hasa, I cannot agree. The picture Palgrave painted of Hufuf, its gardens, its archways, and its industries and people, is to my mind exactly what I saw, and could only have been composed by an eyewitness. It seemed, however, that though both artists had painted the same subject, I had in their books the canvases of two different schools, one by Philby, the Pre-Raphaelite, who when he paints a daisy chain is

careful to have the correct number of petals to each daisy, whereas Palgrave, the Impressionist, gets his effect of the daisy chain without even attempting to show each separate flower. Palgrave was doubtless asked many questions when he arrived home, on subjects that had not interested him during his travels, and rashly tried to satisfy his public by filling up gaps and embellishing his topics with the work of an all too lively imagination, where a golden silence or a confession of some lack of observation would have been the better policy.

In conclusion, I may say that Palgrave's map of Hufuf is so full of inaccuracies that I have not been able even to orient it.

CHAPTER IX

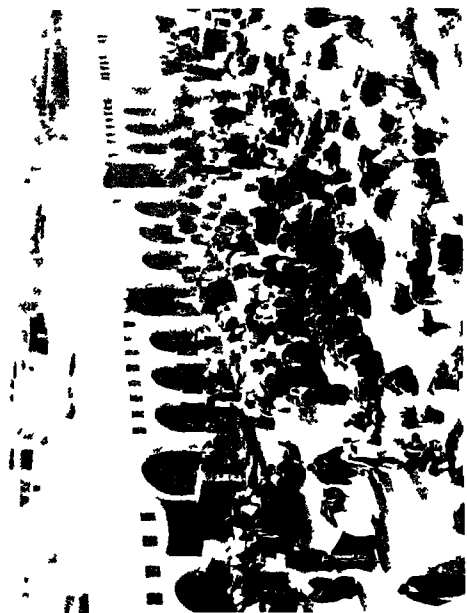
LIFE IN HUFUF

DURING the morning a message arrived from the Governor to ask me to take round some traps to show him how they caught animals, and some skins of animals and birds. We had an exhibition in the middle of the reception-hall, and he seemed most interested in the traps and asked if any were to be obtained big enough to catch Gazelle, laughing when I told him he could get one strong enough to trap a man if he wanted to. He himself is not interested in sport, in fact he is always at the seat of Government and is not seen in and about the town. His only recreation is attendance at the Wahhabi mosque for the five prayers, at all of which his soldiers and officials are also expected to attend. His soldiers told me that since taking over the Governorship of the Hasa ten years ago he had not left the town of Hufuf, with the exception of one journey to Oqair some time before my arrival, when he had met Major Daly to receive from him the decoration of the C.I.E. On the other hand, his sons are enthusiastic falconers, and have some thirty hawks between them, and I think it was on their account that the father was much interested in my guns, cartridges, size of shot, and the distance of effective range of each weapon.

The next thing was to pick up my two soldiers and extend my collection in the adjacent gardens. Said was all excuses. First he wanted to wait till we had finished the midday meal, next he had to pray with the Governor. At this early stage it was impossible to be sure whether he was carrying out instructions from higher quarters to



15 THE DOOR OF QUARI NEW OFFICE HALL SHOWING
PIRIAN INLETTING ON ARCHITECTURE



16 THE SUC AT KHAMIS HALL SHOWING THE NEW
COLONNAD WITH IT ROUNDED ARCH

discourage me as much as possible from going about, or whether he was pursuing an obstructive policy on his own account, either to save himself trouble or to induce me to dole out some money. To-day I favoured him by waiting till he was ready, and we started rather late in the afternoon. But each day I was learning more of the bearings of the town and gardens, and I determined to take Mehdi and leave the soldiers behind as soon as I knew where I wanted to go, and could be sure of finding my way back. The guest-house was inside the Kut quarter, where the Palace, official buildings, and residences are. The Kut is completely surrounded by a bastioned high wall of mud bricks with round towers at intervals, and a moat now dry, and the wall is falling into decay. On leaving the house in which I stayed and turning eastward, one passes the small shops of the coppersmiths. From daylight to dark, Sundays, Fridays, every day, the metallic ring of their hammers is heard as they bend and beat the copper into coffee-pots with long bird-like beaks. One might imagine that such industry, without any opportunity of dissipating the proceeds, must mean an accumulation of wealth, but the soldiers assured me it was not so; the more the smiths make, the more they eat, and it all goes in food, or, to be just, in lavish hospitality to their friends.

The street leads through a picturesque gateway in the Kut wall and issues on to the broad open space running northward and southward, the Suq al Khamis, the scene of the Thursday market (Plate 16). On the far side are the new offices of the Qusaibi family (Plates 15, 24) and a long new colonnade of white masonry arches with shops in covered corridors, part of the new bazaar and of the Sultan's scheme for the rebuilding of Hufuf. At the back of the bazaar lies the Rifa quarter, the eastern side of the town, with merchants' houses and some slums, through which a busy thoroughfare takes the caravans setting out for and returning from Oqair. The walls of the Kut

running beside the bazaar were frequented by many Crag Martins of an unusually pale grey colour. They were busy all day long with the flies that were plentiful in the bazaar, and doubtless went on the high walls to sun themselves. It was impossible to shoot in the crowded town; it was at the same time important to obtain specimens of these birds, which never seemed to wander from the towers. This was one of the problems that occupied my mind as we turned northward up the open market-place to issue from the north gate and cross the chalky sandstone plain separating the town wall from the gardens, and enter the palm-gardens watered by the tepid spring Umm al Khorasan. The spring itself lies in the centre of the cultivated tract and commands lands lying in a slight valley which it reaches by deep-cut channels whence lucerne and date gardens are irrigated by water-lifts, locally called *suds* and worked by white donkeys. On the lower parts of the ground the water can be passed by gravitation to the gardens. The lowest level of all is abandoned to the seepage water, which, fully charged with saline matter, runs out to form a shallow lake, the evaporation throwing down a heavy deposit of the salts. In this system the wonderful drainage of the garden soil accounts for the high quality of the produce. The date trees and lucerne crops strike one as being exceptional, and there are no cases of that appearance of salt on the surface of the land which is such a problem to irrigation engineers in parts of Iraq and India, where it is simple enough to get the water on to the vast level tracts, but where there is often no fall to dispose of the drainage, so that the land is liable to be changed from a fertile plain into a salt desert.

The spring itself rises in a large pool about 150 yards across, from which the distributing channels radiate (Plate 18). On the north side is an enclosed bath-house for women, but most of the ladies seem to prefer to bathe just outside, where the water is cleaner. There were a dozen



17 LAKE OF SHIPAGI WATER FROM THE GARDENS, HULLE JAPAL ABU
GHANIMA VISIBLE IN BACKGROUND



18 THE KHORASAN SPRING, HULLE WOMEN'S BATH-HOUSE IN BACKGROUND.

women in the open water at the time of my visit, some washing clothes and some their children. There is no real need for privacy, as a woman's bathing consists, not of swimming or diving, but merely standing up to her hips in the water, only removing the cloak and veil, and not always the veil. The blouse or under-garment is retained, and although when wet it clings closely to the figure, the wearer is always competely clothed. I had been too fully occupied in looking for the little fish in a pool where they could be captured with a net, to notice the bathing establishment; and having found a few and made plans for another day, I started off towards Eve's sanctuary. Happening to notice the walls as we approached, and being told what it was, I turned off quickly to the left, remarking to the soldiers that I had no wish to invade their privacy. Had I not changed direction on my own initiative, I could have passed by with apparently no resentment on anybody's part. On the other hand, there is always a possibility that an awkward situation might have arisen.

Umm al Khorasan is but ten minutes' walk from the town and is much frequented. At one side an *aba* maker was dipping his freshly dyed mantles of black into the waters to get rid of the surplus dye, which was discolouring the stream for some distance. A butcher was in the middle of the pool with his latest kill, and he bathed himself and washed the meat in one unwholesome operation. We passed through the gardens, which were but three-quarters of a mile wide, and looked northward over a wide plain. First there was the shallow lake of spill-water from the gardens, perhaps twenty acres in extent (Plate 17); then a gently rising sandy desert with scarcely any vegetation, and on the horizon three miles away were chalky sandstone hills, Jabal Abu Ghanima, a hog's-back range of queer and fantastic cliffs and sand-eroded rocks, some 200 feet from base to summit (Plate 29).

The landscape was not too full of promise as a bird-hunting ground. It was becoming evident that the gardens of this oasis were going to prove remarkable only for the small number of species they maintained ; and as I gazed at these arid hills the chances of finding them inhabited by anything that could possibly fly away from them seemed remote. On the other hand, if there was anything there, it could hardly fail to be interesting. With mixed feelings we turned homeward, having sauntered for just over a mile since leaving the house. The two soldiers were feigning great fatigue and repeatedly sat down with a sigh whenever I stopped to examine anything. I showed my sympathy by telling them I was only looking round now, but when I really began to hunt they would probably be killed with exhaustion, being careful to smile, of course, while I said so. We moved several Jackals that sleep luxuriously on beds of green lucerne during the day. They are, by their colour, the common Jackal (*Canis aureus*), with very fine winter coats and ruffs as long as collies'. The soldiers say the inhabitants of Ayun, an isolated village with palm gardens some fifteen miles to the north, eat Jackals. The fellahin probably eat almost anything in the way of meat they can get, regardless of the Quran. Sheep and cattle are much too expensive and scarce to form the diet of any but the merchants and tradesmen of the towns. There is no grazing in the deserts for at least nine months in the year, and camels, cows, sheep, and donkeys have to be fed entirely artificially on lucerne and dates. The Governor has a monopoly of purchase of all straw for the Government ; so the only flock of sheep of any size can always be recognised as that of Shaikh Abdulla, who alone can afford to keep them. Occasionally a man with two or three fat sheep destined for the paunches of the merchants is seen haggling in the markets.

We approached the town from the north-west, the long stretch of high wall with the minaret and dome of the

Ibrahim Mosque showing just behind, and placed centrally, making a picturesque spectacle, as the bare plain without any palms to break the line gives an uninterrupted view of the whole north battlements and wall. The north-west corner of the town juts out in a rectangular enclosure connected with the Kut. It is occupied chiefly by the soldiers. We entered by the north-west gate, over which are rooms built as part of the defensive wall, where soldiers are billeted. I seemed fated that day to experience embarrassing encounters with women. The arches of the doorway are pointed in a style that Palgrave has described, and since there was a vista of the Governor's horses in the stables in the background, I stopped to take a photograph. As I pressed the button I became aware of something cutting extraordinary capers at the further end of the archway, which eventually resolved itself into a woman trying to get out of the range of the camera. She had entered suddenly from the other end, to pass through, and had made as hasty a retreat as her enveloping garments would allow. Had she been accompanied by her men-folk, they might have shown resentment, but the episode passed off without further complications. We continued our way with all speed, and the soldiers themselves were amused; still, I thought it as well to explain that the woman would not appear in the picture as I was only taking the horses in the stable. But on developing the film, I found that the woman occupied the centre of the picture (Plate 20).

That evening I sent Said to ask the Governor if I could ride out to Jabal Qara, a hog's-back range of sandstone hills, nine miles to the eastward, to reach which we should have to pass through the whole length of the palm-gardens, west to east, a little further north than the Oqair road by which we had entered.

I had suggested hiring horses for myself, but Said explained that that would be considered *aiḥ* or shameful. It was the Arab custom, he said, to provide their guests

with everything, and he explained that all the guest had to do was to tip the soldiers handsomely and leave the rest to them. This ingenuous reply did not meet with the reward it deserved, nor did the disappointed envoy return that evening with any message regarding the morrow's expedition. My time was occupied in trying to catch specimens of some pale Pipistrelle Bats that lived behind the beams of my veranda ceiling and promised to be (and eventually were) found to belong to a new subspecies—*Pipistrellus kuhli ikhwanius*, or the Ikhwan Pipistrelle. They were, however, much too active to be captured by my butterfly-net, which never came within a foot of them. Said's absence made it possible that the Governor had sent a message to the Sultan at Riyadh to know how far I was to be allowed to carry out my designs on the birds and beasts of Hasa. If this were the case there was the prospect of a fortnight's or three weeks' delay before a reply could be received. I hoped that the passive resistance I had to contend with was entirely on the part of Said—an indisposition which, being local, would answer to treatment more readily, although the prescription I was preparing was not the pleasant one the patient expected.

At an early hour the following morning a message arrived by Said that the Governor had given orders for horses to be taken from the Government stables and brought the following day for the Qara expedition; for the time being it was suggested that, as it was Thursday, I should content myself with going to a window in Qusaibi's office to watch the crowds in the great market-place. He hastened to assure me that all Europeans had done so. The Governor had, moreover, sent by him a complete set of Arab clothes, with a request that I should wear them, and a duplicate suit was left downstairs for Mehdi. This was obviously a moment when a tip was expected. Though I was quite prepared to reward service adequately when my time came, I was determined not to be coerced into giving away money in and out of season to the sad-



20. THE NORTH-WEST GATE, HURUF, WITH OLD POINTED ARCH



19 THE FRONT OF THE SULTAN'S NEW PALACE, HURUF.

faced, hungry-eyed, or importunate. Said was so surprised that all his wiles had failed that in despair he asked Mehdi how it was I did not give tips, adding as a suggestion, and knowing Mehdi would tell me, that other Englishmen who had passed through gave him such trifling sums as ten pounds every few days. My reply to Mehdi, well knowing it would be repeated, was that I was very different from the rest, and was the first European who had come expressly to shoot birds, while the others were Political Officers who were highly-paid officials. Besides, I had come at the invitation of the Sultan as his friend and guest, and therefore it was not necessary for me to give presents at all unless I wished.

No time was lost in trying on the new apparel. The cloak of black wool is one of the products of Hufuf and is famous far and wide. The only adornment is a collar of gold thread work. These cloaks are called *bishe* locally; but the Baghdad word *aba* for the same kind of garment is understood. The *kafiyya* or cotton handkerchief used as a covering for the head is imported from Manchester. My new one had a figure of a red deer stamped as a trade-mark in the corner. This is one of the few instances where English commercial firms have gone to a country and found out what the people liked, and have produced it in exactly the form desired and at a much cheaper price than it can be made for locally. They have thus captured the market so completely that not only must the local industry of *kafiyya*-making have died out, but the Arab women seem to have entirely forgotten the art. The *kafiyya* is an indispensable portion of clothing in all Arab countries, and the bulk of them are of British manufacture and are carried by caravan from the seaports into the furthest interior. The shepherd's-plaid effect of homespun cloth is cunningly reproduced in blue and white, red and white, or black and white checks.

The market is a sight well worth watching. The new

Qusaibi office is placed in the middle of the crowds (Plate 15). I passed through the busy throng as an Arab, not a soul noticing me. It was a relief after the constant staring that is one's lot while wearing European costume, and the duties of my guardian angels were lightened by the change. On entering the door I was greeted by the youngest of the Qusaibi firm, who came out from a large carpeted room round which was a dado of Arab merchants sitting on the floor. Qusaibi's desk consisted of a footstool behind which he sat to write down orders. We were shown upstairs, where there were more offices into which a customer is taken if a private conversation is desired; and outside these runs a corridor with windows overlooking the market, where, seated on forms, we were at liberty to watch or take photographs between the periods when coffee or tea was handed round. There was little space between the people, who moved round and in and out like patterns in a kaleidoscope. Veiled women were walking along, spinning wool as they went. Some were examining earthenware jars at a stall with the eye of the expert. A man came, asked for a jar, took one, paid for it and walked away. Not so the ladies. Each pot was picked up, made to ring with a flick of the finger, and put down until almost every one had been tested. I think it was the first one picked up on which the choice eventually fell. Next, a cow and a man rushed past, the crowd melting swiftly in front of them, but not so swiftly as it did a second later when the calf followed with a boy in tow, going through the crush as only a frightened calf can. The boy eventually let go, and the calf careered straight through the collection of fragile pots on the stall which the women had just quitted. There was an ominous clatter as the little hoofs sped through among the pottery and out at the other side. The stall-keeper, used to such minor mischances, was quite unperturbed, and to my surprise, when he had rearranged his wares, there was not a single breakage.

We could also see several shops in the covered part of the new bazaar building. The chief shop facing us was that of a coffee-pot retailer; the pots ranged from the largest manageable size downwards, but the medium size, holding about half a pint, seemed to be in most demand. The Hufuf type with the long beak-like spout is made of copper, but the shopkeeper had an equal number of taller pots with shorter spouts, made of a material that looked like brass, and these are brought from Damascus. He also dealt in a side line of wooden bellows ornamented with bright-coloured leather work. An old curiosity shop came next, with a varied assortment of old camel furniture, home-woven saddle-bags for donkey or camel. Here there was a loquacious auctioneer attached to the establishment who kept us amused. He would first appear with a mantle or two which he wore one on top of the other, then he persuaded a certain number of the bystanders to try them on, and they were handed on from man to man while the auctioneer called out the latest bid on each. If the clothes did not reach the reserve price they were returned to store, and a carpet was spread on the ground, and a dozen critical hands were immediately running over its stitches, feeling the nap and so forth. The auctioneer was never happier than when he had a coffee-pounding pestle and mortar to dispose of. With a clanging like a church bell he rushed to and fro till someone bought it to save being deafened. He had a rival whom I took for an auctioneer, but he was really the town crier. As he chanted his theme, I found it difficult to follow, and it had to be interpreted for me. Someone had lost a small boy and girl from one of the villages; another had lost some money on the road and offered a fifth as a reward for its return; while yet another had dropped a donkey-bell.

More than once a small party of camels just arrived from Oqair with trade goods were couched and unloaded. Two or three whacks on the long neck, accompanied by

a word like "hush" from the driver, are enough to make a well-trained camel kneel and then fold up its legs in a cat-like position. A more wayward beast is brought to the ground by additional taps on the shins and by pulling the head down with the head-rope. Camels always get up and wander off at the first opportunity, so this has to be prevented by tying one of the forelegs in a bent position. Any of these operations is accompanied by a snarling and roaring from the open-mouthed camel which means nothing, as they all do it and I have never seen a camel bite. The soldiers told me that a male camel sometimes injures its master during the mating season. The camels in the bazaar, having been unloaded, were given the most unappetising feed of dried *Arfaj* bush. It resembled bundles of sticks from a birch broom, and I had imagined it to be firewood. In answer to my inquiry the soldiers said this would only fill their bellies and would not do them any good or any harm. Their owners would later on give them a few handfuls of dates or buy lucerne, as a diet of these bushes alone would spoil their condition.

A notable was seen crossing the market with one or two servants walking sedately behind. He was more brightly attired than would be considered decorous for a Wahhabi, and his purple-patterned white silk *kafiyya*, probably of Kashmir manufacture, proclaimed him a member of one of the numerous Khalifa branches of the Shaikh of Bahrain's family, paying a visit to Hufuf. There were here and there badawin from the South, as the Hasa people vaguely call the tribesmen from the Wadi Dawasir, or any district that does not lie to the north or west of them. The black cloaks of Hasa do not find favour with them and are replaced by a white wool home-spun garment of the same shape without the gold-work collar, but with a small three-cornered needle-work patch over one shoulder, at once conspicuous among the dark *abas* of the North. Several parties of Ikhwan were pointed out and were spoken of derisively by my com-

panions, chiefly because they are held responsible for the ban on tobacco, and would be the force called in to restore law and order in the unlikely event of that being necessary in Hufuf. They are a dour-faced brotherhood (*Ikhwan* means brothers) and seem to feel the indignity thrust on them by the unkind fate that compels them to leave the Puritan atmosphere of their desert home to mix with the merry townsfolk of Hasa in order to obtain the bare necessities of life.

The remaining hours of the afternoon were spent "at home" in obtaining the temperature of boiling water to ascertain the altitude above sea-level, and making a little sketch of the northern lie of the town from my veranda. We had several small spatters of rain during the day: none were sufficient to lay the dust, but in this country the smallest showers are welcome, inasmuch as the trade of the town is dependent on the prosperity of the tribes and their herds, although the gardens, that is, dates, lucerne, wheat, and rice crops, are entirely independent of rainfall. The winter days, and particularly the evenings, were as perfect as any climate could make them. The shade temperature to-day at local noon had registered 71°. There had been a gentle breeze, sufficient to keep the air in the houses moving, and, it need hardly be added, the surrounding deserts ensure that the atmosphere is bone-dry.

My only complaint, and that not a serious one, was against the house-flies. A new use was found for the butterfly-net when their attentions became unbearable. I shut the door and soon had them confined in the green baize, and threw the corpses to some ants that had a colony in a crevice of the veranda. Mosquitoes were seldom heard, and their absence may almost have been considered a disappointment, for I had heard of the evil reputation of this and other oases for fever, and had hoped to bring home the culprits. During my whole stay I only found one species of mosquito (*Culex fatigans*),

one of the least harmful of the rapacious insects. These never once bit me, but they used to be heard passing over my head after the light was put out. The lamp was hastily relighted in the hope that it would be an *anopheles* at last. Although it was unlikely that an *anopheles* would be found, it is quite possible that they appear in the summer, and despite the fact that I found no trace of sand-flies from November to March, it is more than probable that they would have disclosed themselves later in the year. There are three circumstances which would be unfavourable to the mosquito. The stagnant water is too saline, and all I saw during winter was absolutely devoid of insect life; the little fish inhabit most of the streams and would keep down the larvæ; and not a single man lives or sleeps in the gardens. All depart at sunset and return to their homes in the towns. Once a year, when the dates are ripe, a few are said to sleep in the gardens to guard the fruit from pilferers.

My demand for a hot bath had an amusing sequel. Mehdi was sent down to ask what arrangements could be made, and he returned with the information that all European visitors went to wash in the hot springs. My reply was that I seldom did what other people did, and often did what they did not, and Mehdi was told to get a tin of water and stand it in the sun for an hour and then pour the water into my canvas camp-bath. I awaited events. The silence was next broken by the noise of metal colliding with doorposts, and a man staggered across the courtyard into an outhouse with an enormous copper cauldron. It was, in fact, one of the huge saucepans from Muhammad Effendi's kitchen. It was filled with water, and a fire was lighted underneath. I had my hot bath over the extinguished embers *in situ* when the water was warm enough. A generous sprinkling of boiled rice in the water and round the edge left no doubt of the vessel's previous mission in life. The sequel took place during my absence on the Jabrin journey some time later. On

my return my attention was directed to a small building that had arisen on the veranda. A comfortable new bath-house had been erected with a copper bath which future visitors to Hufuf will take as a matter of course, unless they have read beforehand the chronicle of what the soldiers laughingly called my *ain harr bil jidr m'al effendi*, "hot spring in the Effendi's saucepan."

On November 23, in expectation of an early start for Qara, I received my breakfast of hard-boiled eggs and milk before sunrise. To this I did more than ample justice so that it should carry me through the day if necessary. An hour after the appointed time for starting Said arrived without the horses, to ask if it would not please me better if we waited to eat the midday meal before setting forth. He left hurriedly with a conviction that it would not please me at all and that I wanted to start at once. Another hour had gone by, when a scuffling of feet on the stairs heralded the approach of two servants bearing in their hands the midday meal—pile of rice, chickens and all—with a message supposed to emanate from the Effendi to say that he could not think of allowing me to go without breaking my fast. With mixed feelings, in which annoyance and laughter strove for mastery, I thought ruefully of the extra hard-boiled eggs, and settled down to make a pretence of eating again. Eventually the soldiers, whose forethought on my account had provided themselves with an excellent meal, having emptied the dishes and exhausted all reserves of excuses, brought round the horses and we started.

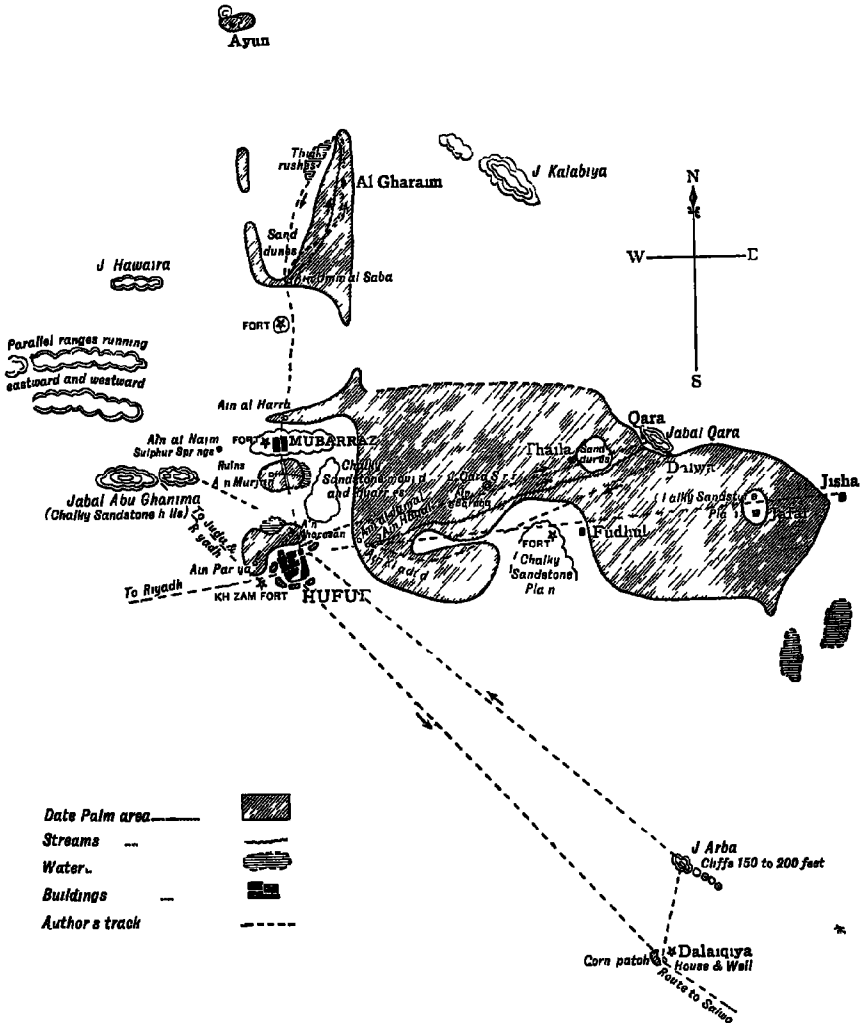
Without giving any reasons, I had asked for a quiet horse, as I wanted to take prismatic compass bearings from its back and had determined to walk it the whole way in order to estimate the distance accurately. Another reason was that the ordinary strap on a Kodak camera is quite unsuitable for any other pace; at every step in a trot the camera swings up and returns to your side with a bang which improves neither the mechanism nor your temper. My

mount was certainly quiet; it appeared afterwards that my request had been taken as a sure sign that I could not ride. No Arab who could ride would fail to show off his accomplishments in the saddle within five minutes of starting with strangers whom he might impress by a hell-for-leather gallop, and my determination to walk could have but one interpretation in their minds. My attention was chiefly devoted to keeping the animal from falling on its nose. The Arab is a bad horsemaster. Although he does not illtreat horses he bestows little attention on them. The Governor has a large stable and unlimited men; yet the horses' hoofs are never pared down. A clumsy iron shoe is nailed on to the end of the elongated and often twisted horn, preventing the natural wear; and so the horses trip and stumble on their way and often fall, and scarcely one of these valuable animals has hoofs that are not deformed, a defect that ten minutes' attention from an English farrier would put right.

We had scarcely left the town half a mile behind and were crossing the sandstone plain that surrounds the north and eastern walls, when a group of Crag Martins were seen hawking flies. Delighted to find them at last accessible, I left my horse and shot two before continuing the journey. Soon afterwards we were in the big palm-groves lying north eastward of Hufuf.

The rice lands occupy the lowest grounds commanded by each spring, so that water can flow over the paddy without artificial raising. Some of these fields have been dug out to bring about the desired level, the surplus soil being thrown up on the boundary banks to a considerable height. By damming up the opening, the ground can be completely dried, and wheat can be grown between the harvest and the sowing of the next rice crop, but it is not of good quality, partly because the ground is weak from the demands of the preceding crop, and also because most of the paddy ground is shaded by palms which draw up the young wheat, giving it unhealthy straw

and inferior grain. The clear water of the Hufuf springs brings down no rich soil to renew the land annually as



PLAN OF HUFUF AND THE HASA OASIS

(A map based on route marches and compass bearings taken from prominent hills, and not a systematic survey Scale approximately 4 miles to 1 inch)

do the flood waters of the Euphrates and Tigris to the twice-blessed rice lands of Iraq, and the Hufuf farmer has to fall back on artificial methods. The refuse from the

villages is heaped outside the town to be carried away by strings of white donkeys for use in repairing the wasted lands.

The rice harvest was in full swing. Men were cutting and piling the sheaves by the side of the plots, whence the donkeys took them to be stacked, often some distance away outside the gardens, where a hard sandstone flat provided a good threshing-floor. A few days were given to harvesting and hardening the grain; then either the rice was knocked out by men with sticks or the sheaves were arranged in a circle, and once more the white donkeys' aid was invoked. Tied to a stake hammered into the ground in the centre, they are driven round and round the whole day long while they trample out the grain, and a man with a long pole and a repertoire of oaths and outbursts of song stands by to see they do not stop and eat the fruit of their labours. The grain is separated from the chaff by being thrown from one heap to another in a breeze. At this stage a little booth appears on the scene, in which a watchman lives till the grain is removed by the rightful owner. On the stubble the rice could be seen to have been either sown or transplanted in stools in even rows, one foot apart in each direction.

The laden harvest-donkeys take up a lot of the narrow path, which is often bordered on either side by an eight-foot slide into running streams. One man or boy manages about eight or a dozen, and as he walks behind the last one, and the rest wander ahead independently, you have to make your own arrangements when meeting them. The previous night's rain, although it had made no impression on the thirsty sandstone of Hufuf, had left these shady avenues very greasy. Three miles from the town we passed over (and I nearly passed into) the pool of the famous Barabar spring. The path was convex, slippery, and on a slight gradient to the bridge, and my bumble-footed mount side-slipped, but by a marvellous acrobatic feat recovered itself and regained the path when all seemed to be over but the splash. The water of the

Barabar is considered the best in the oasis for drinking purposes, and when the Sultan travels from Riyadh to Hufuf, supplies of skins of Barabar water are sent out some hundred miles to sustain him on the road. As we travelled eastward towards Qara the land level fell, rice land increased and lucerne decreased; in fact, the gardens of Qara "drink" from the Khadud spring which rises some eight miles westward within a mile of Hufuf, and to the eastward.

One of the royal estates was pointed out on our right and seemed to be part of the land "drinking," as they say locally, from the Barabar; and the Qusaibi family owned one on our left. There was a small sandstone mound on our left, the summit a little higher than the palms, and it proved one of the few landmarks in the forest which I was able to see from a hill outside and get a bearing on some three months later. With insolent familiarity Said asked if it would not suffice if I got on the top of this without going the whole distance. He remarked that the Governor was expecting them back in time for the midday prayer, and added that there were no birds at Qara and this hill was called Qara Sirir or the Little Qara. I was now sure that his obstructive behaviour had nothing to do with any higher authority; that he was, in fact, attempting to play the "old soldier" on an old soldier; and I determined to bring about his graceful retirement from my service at the earliest possible opportunity.

A small village called Thaila was passed, lying close to the path and about six miles from Hufuf, a mere collection of the masonry-built hovels of cultivators. The streams were an unending source of enjoyment as we rode along. Even in England these glades would stand out as beauty spots, and to the desert dweller they must be proportionately more wonderful. The streams reminded me somewhat of the gardens in Teheran, where rivulets from the Elburz Mountains are led along the garden paths at

certain times of the day ; but these have not the permanency and vitality of the Hufuf streams, which are as full of life as an English trout stream. Patches of bright green starweed and streamers of a ribbon-shaped waterweed swayed to and fro in the current and made sheltered patches on the surface, where whirligig beetles danced a rigadon of delicate turn and twist. Dragonflies with crimson and carmine bodies chased each other and basked on the sunny banks, and a blue Kingfisher gave another English touch to the scene as he darted past and settled on an overhanging willow, watching the little fishes in the clear water below, good digestion waiting on appetite.

On emerging from the gardens our first glimpse of the Qara Hills was obtained across a bare plain of sand-dunes encroaching on the cultivated lands to the south. It seemed to me that we had evidence of sand-dunes in the making. The plain was a sandstone outcrop too high to take the irrigation water of the canals, the rock being thus left to undergo disintegration through weathering. Wind sweeping across carried away the powdery stone, and piled up the loose sand of which it contains a large proportion into billows. As soon as we were in the open, Said, bored with my slow pace, urged his horse into a gallop and streaked across the sands, his loose clothes flying in the wind. When we caught him up he was lying flat on his back with an air of unconcern, while his steed, which he held by the lead, was enjoying a roll in the white sand, saddle, trappings and all. It was always amusing whenever we dismounted to see these Arab horses curl up and lie down at their masters' feet, in the same way as dogs do, awaiting their pleasure to continue the journey.

After a short march through gardens, mostly bearing rice and inferior palms that seemed to have their roots in too much water for their well-being, we entered the small Qara village under the lee of the Qara range, to the west of it. The houses were solidly built of sand-

stone blocks, though there were none of any great size, and all were the residences of cultivators in the neighbourhood. The village was not walled, each house having a stout wooden door and high walls that would make it fairly safe in the event of an attack. We saw no shops as we passed through the narrow streets, and only one man, but there were several of the humped cattle I had been hoping to examine more closely. They were probably originally imported from India, but have developed such long thin faces that the relationship is not now apparent. The bodies are frameworks of bones held together by a tough hide. It is possible that they are a lean race, but their treatment leaves much to be desired, and beyond the little they can pick up by scavenging in the towns, they never seem to be fed. A cow's carcass was lying by the roadside and the bones were being picked by a relative. A cow in the rôle of a cannibal was something new to me, but a little further along we passed another carrying and chewing a bone as it went with a relish more worthy of a jackal. In the gardens of Qara almost every crop of corn or vegetables was protected from the evil eye by the bleached skull of an animal stuck on a pole. It was more conspicuous here because the supply of dead cows enabled each small owner to provide an entire skull, but the same superstition prevails all over the oasis and in other places such as Basra and Baghdad, and I have seen crops flourishing under the protection of a gazelle skull, while even a white bone is considered efficient.

The calcareous sandstone range is almost a mile long, running northward and southward, and about 200 feet high (Plate 21). The rock itself is white, but when exposed to weather becomes chrome yellow and pinkish. Many huge blocks have tumbled down and surround the base, forming shady nooks and caves, on account of which the place is famous as a resort of the people of Hufuf, who come out to stay in them for a few days to escape from

the heat of the summer. Palgrave says this custom was prevalent in the days when he visited Hufuf, and had excited the wrath of Faisal, the ancestor of the present Sultan, who was so afraid lest such diversions should focus the people's minds on this world instead of the next that he placed a ban on these expeditions and fined and imprisoned any culprits. Times have changed now, and the present Sultan is more likely to take a party of his friends to enjoy a picnic of this kind at Qara (although I never heard of his doing so) than to attempt to prevent his people from going there.

The nine miles of road had been a disappointment, for beyond the Wren Warblers and Bulbuls no fresh species of any interest were to be seen, and now we had left the gardens not a bird was visible. I had allowed myself to hope that this bare range, being near running water, would be certain to contain the pale Desert Lark (*Ammomanes*), of which I had obtained one specimen on the hills at Salwa, for I required a series in order to make sure that its peculiarities were constant and would justify its being classed as a new race. There was no sign of these birds. Their discovery was to be reserved for another occasion. The solitary incident of ornithological interest was provided by a sight of one of the Crag Martins cruising round the hill. This phenomenon suggested that their home was in the cliffs of the outlying ranges, and that their appearances in the town were merely foraging expeditions. Moreover, if I could prove that they bred in the cliffs, their status as residents would be confirmed.

The Shaikh of the village came out to us with some small sour limes, pomegranates, and some black dates he called Rotab, followed by the inevitable coffee-pot. I was all the more content to sit down with the company for an hour, as there was nothing to shoot. After coffee I lighted my pipe, and the Shaikh asked if I would like to examine theirs. Knowing what lay behind the suggestion, I expressed very great interest. A very ordinary nargila



21. CHALKY SANDSTONE HILL AT JABAL QARA, HUFUF, SHOWING EFFECT OF SAND EROSION.



22. BATH-HOUSE, AIN AL NAJM, HUFUF.

with a clay bowl showing much use was produced, and was soon being passed round the circle, Said joining in. The other soldier, Muhammad Hasan (Plates 42 and 48), did not; he was, in fact, a believer in the Wahhabi tenets, which he unobtrusively observed himself without ever trying to force them on others.

Conversation ran on agriculture; our host was a cheery hospitable man and seemed well satisfied with the Government, although in the presence of soldiers his complimentary remarks were perhaps suitably framed for repetition. His crops of rice, thanks to Allah and the beneficent rule of Abdul Aziz (the Sultan), had been good. This seemed a favourable opportunity for finding out the truth about Palgrave's buffalo. The Shaikh had been to Basra and had seen them swimming in the river and was sure no one had ever attempted to bring them to Hufuf. He said that cows in Hasa were not used for any kind of work and were kept solely for milk; they did not yield the quantity a buffalo would, but it was richer and contained more butter. He had seen aeroplanes while in Iraq, and he and Said engaged in a conversation on their merits. The latter has apparently been in action against both aeroplanes and armoured cars and has gained a very wholesome respect for both. I heard him on the return journey, after giving me up as hopeless, trying to extract a little military information out of Mehdi, who knows less than nothing on the subject. The answer to the first question cheered him, as he learnt there were fewer British troops in Baghdad than there used to be—Mehdi, of course, meaning that there were fewer there now than during the British occupation in war-time. His next question was, how many aeroplanes there were, and Mehdi's answer of "*Wijid, wijid*" (unlimited, unlimited) took the heart out of him and the conversation.

The Shaikh asked if I wanted to climb the hill or see into the caves, and I said that as there were no birds and it was a long way home, we would start back at once. Some

of the caves are dark and long, and Arabs only venture in with a rope, which they uncoil and follow to find their way out. Others are full of Bats, and their smell, and the swarms that come round you if you disturb them by going in with a light, deter the men from entering. This account exactly corresponds with the experience of Mr. Anderson on entering a bat-infested cave in the Tombs of the Kings in Egypt. The species is the Trident Leaf-nosed Bat, of which I afterwards shot three examples coming from the direction of the sandstone hills. They are indistinguishable from Egyptian specimens, a fact that has materially increased my interest in the tomb of Tutankhamen.

Another small village called Dalwa lies at the south end of the hill. We passed a kiln right in the chalky sandstone, where the earthenware pots and jars are baked. For some reason this particular kiln has been deserted for years, a load of pots having been left lying just as they were when the last fire went out. The pottery made from this material is a beautiful shade of pale sea-green.

The journey homeward was even more disappointing than that of the morning. The southward course led us through less cultivation, and we eventually joined and entered Hufuf by the Oqair road. When passing one of the old Turkish forts Said made one last desperate effort to start a conversation on what, to him, was the more interesting subject of military matters, and volunteered the information that Saiyid Talib of Basra was once Commandant in Hufuf, under the Turkish Government. He was in the middle of an enumeration of the battalions and men in the command, when I left him to stalk a Desert Wheatear, my only specimen for an eighteen-mile journey. On my return to the road, I saw that the soldiers were passing the time in prayer. I think this was my last day of probation. The fact that I did not want to stand on the top of Jabal Qara and take bearings as the Turkish officers did, and my studied lack of interest in any military

or political subjects, convinced them finally that I had really come to collect birds. Said had, I think, been told to find out anything that might underlie the declared purpose of my visit, and in his clumsy manner had done his best. He seems to have had a varied career and had at one time been Amir of Qatif, a much more responsible post than he now held, and I should imagine that free interpretation of the gospel of self-help had caused the termination of that appointment.

The next day, November 24, was bright and sunny; the clouds of yesterday had ended in the evening with a few light showers, but had dispersed. I was so depressed with the poor results of my excursion that I jumped to the conclusion that there was nothing worth waiting for in Hasa, and determined to see Shaikh Abdulla and ask what chances there were of continuing my journey to Riyadh. It was most fortunate that I was prevented from acting upon this hasty decision, for had I gone on within the next few days, I should not only have missed a new race and several of the most interesting birds to be found in the Hasa, but several new rodents and two new Bats would not have been collected, and it is most unlikely that the journey to Jabrin would ever have taken place. However, my good fortune was not realised till long after, and I waited in impatience. The Governor sent a reply that he would prefer to see me in the afternoon, when most of the business of the day had been despatched and we should have the reception-hall to ourselves.

Three kinds of wheat were on sale in Hufuf bazaar: one was imported from Karachi and Iraq, and so had no interest for me, but the other two were grown locally, and samples were brought for me to take home. The best quality is called *Saidiya* and is a good, even sample of a hard red wheat unmixed with barley, which has been identified as *Triticum vulgare*; the other, known as *Koda*, besides being a mixture of two wheats, *T. durum* and *T. vulgare*, contains about 9 per cent. of thin barley.

Another purchase was made in the bazaar which was astoundingly cheap. I wanted a wooden box about two feet long by a foot wide and deep, to pack the specimens in, and found that a most suitable pattern was being made out of the wooden cases of petrol tins at one rupee eight annas (one shilling and tenpence) each, with iron hinges and a clasp. We had bought an exactly similar thing in Bahrain a few weeks before for four rupees. Rupees were freely taken by the tradesmen, and change was given in small Turkish currency. Cigarettes were on sale in the town; it is a clandestine trade and they are not exposed in the shops. This small concession is made to the Wahhabite Government, but by going to the back, that is, into the private residence of certain tradesmen, cigarettes can be bought at the high price of four rupees a hundred (5s. 4d.). The tobacco is the sun-dried product of Mosul and Kurdistan. I used it to eke out my supply of twist, and found it not unpleasant in a pipe.

The Hufuf dates are of the following kinds: The Khelas comes first in local estimation, and is apparently famed as far as Bombay; but the supply is limited. They are golden-yellow soft dates, but when packed come out singly from the mass. Unfortunately they are packed with aniseed sprinkled over them, the flavour being to my mind inferior to that of the date by itself. They grow at the western end of the oasis, that is, nearer Hufuf town. The chief difference in the gardens is that the land is usually higher above water, and it would seem that these palms prefer a drier soil. The date-stone is long and thin.

The next in importance is the Reziz. These are a dark golden-red, are firm and smaller than the Khelas, and have short rounded stones. I thought they had a better flavour than the Khelas, though Hasa opinion does not agree to this. They also seemed equal or superior to Tunis and African dates. There are also Shesha or Sheshi, a red date, Knaizee, which is black-red, and Khasab or Rotab, a black fruit. Of the last three I only saw and tasted the

Rotab, which is considered inferior, and only the two first are thought to have any commercial importance. Ashal is red, and is only eaten off the tree and not packed.

The Governor had not seen me in Arab clothes before. I dropped my shoes, as I entered, among the collection of sandals that congregate round an Arab doorway, and silently approached him with bare feet. He was alone with the exception of a small group of slaves, and was engrossed in a list of accounts in Arabic figures, which I thought were probably Revenue returns he was auditing. He did not hear me till I was close to him, and then he merely raised his eyes and was about to continue his calculations, when a look of recognition lit his face, and he jumped up to shake hands. "I am sorry," he said. "I did not recognise you, and thought you were an Arab." I thanked him for making arrangements for my comfort, and said that my work in Hufuf was finished, and I now wanted to go on to meet the Sultan in Riyadh. He said he would see what arrangements could be made, and let me know in a day or two.

The horses in the Governor's stable look sleek and fat and are not stinted in their food. Three times a day they have a feed of dates, and in the fourth meal, about sunset, they are given as much green lucerne as they can eat. There is also a guard over them all night. This duty is performed as a punishment by soldiers who have committed some crime, so is unpopular. While we were walking by the stables after dark I was surprised to hear clanking chains approaching, and had just concluded that the sound came from a hobbled horse, when a man in irons appeared out of the gloom to see who we were and what our business was.

To-day, Sunday, November 25, I had an example of the working of Shaikh Abdulla's judicial system. One tribe had been fined for fighting with another, and the 600 camels, besides sheep, it had been condemned to deliver up arrived in the outskirts of Hufuf to-day. All the

soldiers were fully occupied with this business, and at the same time there came news that one villager had stolen a camel and a donkey. Therefore they had to draw on my staff, and Muhammad Hasan was called upon to ride out, find, and bring in the thief.

During the day a messenger came to say Muhammad Effendi was coming to see me, and I had hardly time to slip on my Arab cloak and *kafyya*, for the old gentleman was close on his heels and a little out of breath after climbing the stairs. We sat on one of the benches in my bedroom, and after a preliminary sentence or two about animals, we arrived at the purpose of his visit, as it would be impolite to start immediately on any important conversation, however short the time or pressing the need for haste. In fact, so delicately wrapped up was the message and its purport, that I entirely failed to realise that one had been delivered, although it was certain that the Effendi had not come in merely to pass the time of day. To use his own words, Shaikh Abdulla had told him there had been no rain on the hundred and fifty miles of desert that divide Hufuf from Riyadh, and there was no food for camels *en route*, and all birds and animals had also left that district and had gone northward, where abundant rains had been falling since early autumn. In fact, he said, there were many animals on the Kuwait road, where there would be good hunting. With a few more remarks on unimportant subjects, the old man departed, leaving me in some perplexity as to what it was all about.

It was actually an invitation to go on a trip to Kuwait instead of to Riyadh, so that the camels should not suffer for want of food. My peculiar form of travel made the big waterless stretches a matter of difficulty, as I wanted to wait sometimes a day, sometimes two, often where there was no water and no grazing, whereas those who had charge of the camels would want to stop where it was best for their beasts, and hurry along without a single halt between; thus, the two ideas of marching were in-

compatible. No doubt the Governor thought that if he could tempt me into a part of the country where wells occur at frequent intervals, and where there would be ample feed almost anywhere I stopped, I could dawdle on the march as much as I liked without harming his camels. Had the 400-mile march thus tentatively suggested ended somewhere in the interior, it might have had more appeal, but I did not like the idea of finding myself at the coast at the end of it, with a good chance of being informed that there was insufficient grazing to allow me to come back into the interior again, and having no alternative but to take the first steamer back to England. It seemed wiser to await further developments and see more of the outskirts of Hufuf meanwhile.

An hour or two spent in the gardens served to revive my interest in the place. With the help of the butterfly-net, some of the small fish in the Khorasan spring were captured. The largest were no longer than an ordinary pin, but, not having seen any mature fish, I did not realise that these were merely small fry. As we walked through lucerne gardens, a Jird, a rodent of a pale sandy colour, the size of a rat, with an enormous length of tail, ran along the path in front of us and entered a hole in the base of the mud wall that is built round the boundaries of most gardens, marking off the different small properties. Some walls are only three feet high, though others are real barriers some eight feet high, with the top layer inset with thorn-bushes. The base of the walls is honeycombed with the earths of these animals, and the men working there said they came out when the sun was warm and ate lucerne. Thinking they were all nocturnal animals, I disregarded the local information, and Mehdi was sent to spend several fruitless hours during the night watching traps baited with coco-nut.

The lucerne seems to be the only garden crop grown systematically, and monopolises most of the ground under date trees in the western and central portion. In the

growing of these two crops the native of Hasa has nothing to learn. The lucerne brings nitrogen to the soil, which is beneficial to the dates, and the successive crops of lucerne are maintained by a heavy top-dressing of manure brought from the towns and mixed with fine sandstone dust, going on to the ground as a rich fine powder. This green crop also is cut all the year round; as soon as the roots flag, the plot is dug up, manured and sown again. There were several patches of young seedlings coming through in November and December. Certain gardens are given up to orange, peach, pomegranate and citron trees, which do well under date-palms, and, once planted, need or get little attention beyond gathering the fruit. This occupies the higher levels; the lower-lying fields are given up to rice. The rest of the gardening is of the haphazard kind, a small patch of onions here or egg-fruit there.

Most owners have a short row of bushes that reminded me of privet. This is the henna, which is very much to the fore in the markings borne by the white donkeys. There are few that are not disfigured by lines and patterns of red stain, and the fingers and toe-nails of the elegant inhabitants are similarly reddened. The boughs with green leaves are hacked off and dried in the sun. The whole is then pounded to a green powder, which is next mixed with any acid liquid to form a paste, and smeared on to the part which it is desired to colour, and allowed to dry. After ten minutes the paste is removed, and the red stain remains. Treatment with henna is supposed to prevent and cure saddle-galls by hardening an animal's skin, and the patterns must be useful as identification marks where so many thousands of white donkeys all exactly alike perpetually meet and mingle. Aniseed is another plant seen in most gardens, scattered in any corner like a weed.

[*November 26.*] It was arranged over-night that I should ask permission to walk out into the gardens and obtain some more Crag Martins, which seemed to arrive in the town about two hours after sunrise. At the

appointed time no one had turned up; later a message came from Said that he would come with me in the afternoon—which did not strike me as very hopeful with regard to the morning flight of the Martins. The afternoon and evening passed, and no one came, and I had been prepared to start at a moment's notice the whole of that entirely wasted day. Collecting in Arabia is not so easy as it might appear. Even when you have an invitation from the Sultan, it would be quite possible to come into the country and leave without accomplishing your object.

The servants were kept busy running into the bazaar, finding and bringing all the coins that are considered as currency in Hufuf. Gold is not seen in minor transactions, although the English sovereign and Turkish lira would, of course, be accepted anywhere in the town. It is strange that an Englishman's cheque is held in higher esteem in these countries than the equivalent in Indian rupee or English pound notes, and it speaks well for our prestige. Mr. Keeling, who escaped from imprisonment in Turkey during the war, told me that as prisoners they had no trouble in paying for anything they were able to buy of local tradesmen in Turkey, since cheques were taken readily. After the Armistice it fell to his lot to take a large sackful of these cheques to England to be redeemed, and with a very few exceptions they were all honoured by the drawers. The exceptions were, of course, those of the deceased. Since the British Government then decided to honour these, every cheque in his bagful was duly met. Riyals (or Maria Theresa dollars as they are called in English), large silver coins as big as a five-shilling-piece and weighing just one ounce avoirdupois, are the most used, as they are the only coins that are accepted by the badawin. The riyal is a coin of handsome design, with the head of Maria Theresa of Austria on one side and the Austrian double-headed eagle and coat of arms on the other, dated 1780 (Plate 23, *a* and *b*). Mr.

J. Allen, of the British Museum, tells me the Maria Theresa dollar of 1780 is still struck in Vienna for export to the Red Sea, as it is the most popular coin there. "Why it is so popular," he says, "I do not know, but it quite drove the Spanish and Dutch dollars out of the [Arabian] market."

There is one other coin that counts in Hufuf, the tawila (Plate 23, *f* and *g*). One hundred and fifty of them equal a riyal, but although prices are usually quoted in riyals and tawila—that is what an auctioneer meant if he called out "three ten," for example—the tawila is the most difficult of all to obtain, and is almost extinct. It is, or was, a token in the shape of a stout piece of copper wire two inches or so long, doubled, and stamped with an unintelligible portion of ornate Arabic inscription, the two ends being forced apart into a V shape. A diligent search lasting through several days produced but two, and I was told that one would be accepted in the shops at a value of one penny farthing, though this token is not used outside Hufuf. The tawila doubtless had its origin from the Persian larin, a silver coin of similar design. Mr. J. Allen, in his paper on the larin and other coins in the *Numismatic Chronicle*, Fourth Series, Vol. XII, of which he kindly sent me a copy, says: "The larin was one of the standard currencies of the Indian Ocean about the end of the sixteenth century. It appears to have been first struck, probably about the beginning of the sixteenth century, at Lar in the Persian Gulf, from which it takes its name." One of the white-metal Turkish coins is now called tawila (Plate 23, *e*). The rest of the small-change difficulty is overcome with modern Turkish coins, introduced during the occupation by the Turks, and left behind when they were evicted. Silver rupees Indian (one shilling and fourpence) were taken without demur at 85 tawila value.

Yet another coin is accepted here, the Baiza or Baiza hamra of Oman, but it is not generally used. My



a



b



c



d



e



f



g



h

23. *a* and *b*. RIYAL OR MARIA THERESA DOLLAR.

c and *d*. BAIZA OR BAIZA HAMRA OF OMAN.

e. TAWILA, MODERN TURKISH WHITT-METAL COIN REPLACING COPPER TOKEN.

f and *g*. TAWILA, HUFUF COPPER TOKEN.

h. HALF-CROWN, ENGLISH, TO SHOW COMPARATIVE SIZE.

information was that it was more in favour at Riyadh, where this and the riyal reign supreme. The Baiza is a copper coin about the size of a halfpenny, and two equal one tawila (Plate 23, *c* and *d*). They were minted by order of the Sultan of Muscat, Faisal ibn Turki, A.D. 1895. On one face is written in English, Faisal ibn Turkee Imam of Muscat and Oman, $\frac{1}{4}$ anna, and in Arabic, Muscat and the Muhammadan date 1315. On the other side is a circular wreath of leaves, and across the face is written, in Arabic only, Faisal ibn Turki Sultan Oman. My informant said that the Kurush or Geraish, which I often heard mentioned, is a sum of money not represented by a coin but much used in conversation, and it either defines a third of a rupee or indefinitely money, payment, etc.

As my values do not in all cases correspond with those given by previous travellers I will add a list corrected for February, 1924 :

Oman Baiza equals half a tawila.

Copper token tawila equals one tawila.

Turkish white-metal modern coins :

About the size of an English threepenny-bit, called Nus baiza, equals quarter of a tawila.

About size of an English sixpenny-piece, called Baiza, equals half a tawila.

Just less than the size of a shilling, called Tawila, equals 1 tawila.

About twice the size of a shilling, equals 2 tawila.*

Modern Turkish silver coins :

Smaller than a threepenny-bit, equals 6 tawila.

About twice the size of preceding, equals 12 tawila. *

About the size of a shilling, equals 30 tawila.

The Rupee—Indian—equals 85 tawila, usually about one shilling and fourpence.

Riyal—Austrian—equals 150 tawila, about two shillings and fourpence.

The Rupee and Riyal would vary according to the exchange.

My collection was increased by two Geckos, ghostly white lizards that appeared from the roof-beams in the evening and searched the walls for moths and flies. By balancing myself on a chair it was possible to dazzle them with the electric torch and hold them to a beam with the end of my gun-barrel, which reached the ceiling ; but the chase was not over then, as it was necessary to wait till all of their four sucker-toed feet were free of the beam at once, and then release them so as to let them fall to the ground. One toe on the beam was enough to enable the Gecko to swing itself back into safety in a flash.

CHAPTER X

LIFE IN HUFUF (*continued*)

[*November 27.*] The morning broke cloudy. During the previous evening we had what was our heaviest shower so far; it was just more than enough to lay the dust. It was hard to believe the ground here could ever reach the stage of mud, but the servants said that after some storms the camel transport between here and the coast was completely held up by slippery roads, and in one winter, which will remain an unbroken record for many years, a heavy shower left in some of the streets in the town pools of mud and water that did not dry for two months. This is an annual occurrence in Baghdad.

Since Sparrows and Bulbuls form part of the diet of the Hufuf epicure, it is only the shortage of powder and small shot that accounts for their surviving in such numbers. The guns are Early Victorian muzzle-loaders of English manufacture. There is a long single barrel, and the stock is proportionately small. The owners add a wooden semicircle to the stock, decorated with gazelle skin, so that the end of the butt does not fit into the shoulder. The rifles of the tribes are mostly old Martinis, whereas the Government soldiers have modern short Lee-Metfords.

To-day was an eventful one in the history of my expedition, as I was able to bring about Said's exit from the scene and felt that serious and unhampered work would now commence. It was, moreover, a comedy. He had come round with excuses that yesterday there had been extra work and his services could not be spared; so I patiently arranged once more to start half an hour before the time of arrival of the Crag Martins, and he left. As

he did not arrive at the appointed time I took my gun, and Mehdi and I set forth, the collecting-tin concealed under our cloaks. Having sent one of the servants to find Said and Muhammad Hasan and tell them we had started, we made all speed through the town and out into the open plain to a sandstone quarry, where we made ourselves ready in case the birds came over. They did not come, so no gun was fired to give our direction, and we had passed quite unnoticed through the crowded streets and left no clue to our whereabouts. After about an hour we saw a figure in the far distance emerge from the western palm-gardens, wandering here and there and questioning passers-by, and could easily recognise the dress as that of Muhammad Hasan. I had no grudge against him, as he had only been taking his cue from the older man, but he was too far off to hail, and the extra walk did him no harm. He eventually saw us sitting on the ridge of chalk and sank down behind me with a sigh of relief. He said no one had seen us, although he had stopped everyone to inquire in the town and in the gardens. This was, of course, good news, as it would reach Shaikh Abdulla's ears that I had gone off without an escort, and Said would be held to blame. Muhammad did not know where his colleague was; they had parted in Hufuf and had taken different roads in the hope that one would find us. Soon we saw him emerge from the eastern palms a long way off, riding a donkey he had commandeered from a small boy. His path brought him just where we were sitting, and he was close to us before he saw us. Jumping from the donkey, he tried to look as if he had not been riding it, but the poor boy followed behind, hoping for a tip, while the ungrateful tyrant under his breath kept telling him to take the donkey away. I congratulated Said on his style of riding a donkey, pointed out that he had forgotten to recompense the boy, and asked innocently why he had come out; while he, wondering what reception he would get from Shaikh Abdulla on his return, and how

far the story would have been noised abroad, and what excuses he would be able to make, maintained a sullen silence and sank down to rest.

It was my day at last. He was spared the rest of my sarcasm, as at that moment a party of Crag Martins appeared over the plain, and I shot four. A caravan of badawin with camels and several parties of donkey-boys were approaching the town and paused to see the sport. Shooting in the air at flying birds is to them an unheard-of feat, and they cheered the successful shots with appreciation. We returned to the house in time for the midday meal, the two soldiers following in chastened silence. As I entered the door, I said pointedly: "To-morrow I go out at eight o'clock," and with that left them. This was the last of Said, who from now went out of the story, to appear only once more a month later when I gave my first tips and considered he had earned some recompense for meeting me at Oqair. He did indeed turn up again in February, when I had given some tips to the servants who had been useful to me before I left for Jabrin. On that occasion he had done nothing, so I thanked him for the honour of the visit and sent him away empty-handed with a "fi aman Allah" (in the keeping of Allah).

About noon Mehdi set forth at his own suggestion to test the assertions of the cultivators that the Jirds only came out in the sunlight, our own attempt at night-trapping having been a failure. He took the .410 collecting-gun, having enlisted the co-operation of a villainous-looking friend he had picked up in the bazaar, who, according to his own modest account, could hit a needle with a rifle bullet at 100 yards. In case the crack shot found the animals a more difficult mark than the needle, he took six traps and some bread to bait them with. In an hour or so he returned triumphant with a Jird that had walked into the trap while he watched. It was a pale fawn colour with a long tail with a bushy black tip, while the hair was so sleek and silky that the body was difficult to hold even

when lifeless. The afternoon was fully occupied in skinning and labelling this and the Crag Martins. After dark, the stars shone with unusual brilliance and prompted another set of observations on Vega, Capella, and Polaris to check those taken on two previous occasions from my veranda in Hufuf.

There was no delay in starting from the house next day. Muhammad Hasan, who, I am glad to say, had taken Said's place as chief of my escort, was all ready before the appointed time. He retained the post throughout my stay, and was in charge during the expedition to Jabrin, and saw me on to the boat at Oqair some four months after. During that time we were always in complete agreement. Any plans were talked over between us beforehand; he gave his point of view as regards the welfare of the horses or camels for which he was responsible, while I gave an outline of what country I desired to collect in. Details were thus settled in the best interests of both, and the day's programme was properly followed.

Last night a Wolf barked close to the town walls. It is a loud, wild howl, and would be blood-curdling on a lonely road. It also rouses the interest of the town dogs and sets them barking, whereas they do not give tongue for a whole jackal-pack, wailing and whining as is their wont. Hufuf is not cursed with the usual crowd of noisy pariah dogs associated with Arab towns; in fact a dog is rarely seen or heard, and it was only the howl of the Wolves on still nights that led me to realise there were a few in my neighbourhood. The Wolves here are most nearly related to the Indian Wolf (*Canis pallipes*) and are solitary, seldom hunting in packs like their larger relatives of northern latitudes. As in all other countries, they hold a high position in Arab folk-lore for sagacity, courage, and thieving propensities. The howl of the Indian Wolf is quite distinct from the Jackal's and consists of three or four sharp, high-pitched barks in quick succession, and then a long pause before it is repeated. It can be heard a long distance. Only once

have I heard a similar howl. Many years ago I was nursing some well-bred spaniel puppies some twenty-four hours old, afflicted with some fatal malady akin to epilepsy, and as each one died it gave an exact representation of the wolf bark, so loud that it was difficult to realise the sound came from the tiny atoms in the straw beside me. It was twenty years after this that I first heard the Wolf howl round the camps in Mesopotamia, but the memory of the puppies' bark that had so surprised me came back at once to my mind, and I wondered whether the abnormal noise made by the small spaniels could be connected in some way with their dim and distant ancestor, the Wolf. The bark of a dog bears not the slightest resemblance to that of this Wolf.

The Hufuf children are jolly little people, and have a fund of devices for amusing themselves. At an early age they are turned out into the street to play. Unfettered by clean clothes, they are at liberty to get as dirty as they please, and their days are one long festival of mud-pie or dust-pie making. We watched one grubby mite to-day arranging an imaginary shop with small objects laid out in rows, and lipping out an animated conversation between a supposed purchaser and the salesman. Some spirited fights take place between five-year-old warriors of the town against Ikhwan of the same age. The miniature battles are waged with a good deal of noise on both sides and are about the only thing that causes a temporary cessation of the ring of the coppersmiths' hammers; for the whole bazaar turns out to separate the combatants, hear the cause, and condole with the wounded. The noise of the coppersmiths at work is not irritating, by the way; one gets accustomed to it, and after a while it is not even noticed.

The nights are quiet. Before dawn the silence is broken only by the distant creak and groan of the water-wheels in the gardens some half-mile distant, followed by the splash of water as the skins reach the top and pour the contents into the troughs. Then there is a bang, bang,

bang at the heavy wooden doors of one of the shops opposite, and a voice calls, "My Brother!" the banging being resumed until the sleepy voice of the brother answers, and after a short interval the drawing of bolts proclaims that the household is aroused. Next the still morning air is rent by the musical call to prayer uttered by one of the faithful from a house-top: "Allah Akbar, Allah Akbar ('God is greatest')." Soon a hundred voices are proclaiming the fact from a hundred different roofs, and so the day breaks in a Muhammadan town. The call to prayer thus heard reminds me irresistibly of a huntsman with a good voice to hounds cheering them on in cover.

The only instance of barley cultivation in Hasa was found to-day as I was following my usual plan of examining the seed of any growing corn. This plot was sown with barley, not broadcast over the plot but sown in tufts a yard apart in a row round the outskirts of a patch of lucerne seedling. This method of corn-growing seems to have been adopted to ensure that the barley gets a maximum of sun and air. The plot itself was deep in the shade of some palms, and in ordinary circumstances would have produced a weak straw and small grain. This small plot was only worthy of notice on account of the controversy raised by Philby.

The blood-warm stream running from the Khorasan spring contained a variety of water weeds. The most plentiful was like the mare's-tail in England and had whorls of fibrous leaves, but there was also a brilliant green plant with leaves of two distinct shapes. On the edge of the older leaves emerged complete little plants that were eventually cast off from the parent plant. I had noticed this method of reproduction in ferns, but not in water weeds, and although it made a wet and flabby specimen when removed from the water, a plant was brought home and identified as the Water Fern. It is a rare and peculiar plant anywhere, and only this one representative of the

family is known. Among the plants were two shapes of water snails, so small that they could hardly have been mature. The temperature of this spring was not taken, but it felt warm, and was cooling rapidly in the air, which was about 70° . In the summer, when the air temperature would rise to 110° in the shade, these streams would get hotter, and those that issue from the ground at about 90° would be about 100° . The natives naturally are deluded into thinking the springs are warmer in the winter than in summer, not realising that the apparent difference is in the air. They also believe that the large holes in the ground out of which the streams appear are made by falling stars. Even one of the educated and travelled Qusaibi family told me this with an air of finality that silenced the discussion. If proof were required, there was the water and there was the hole where the star went in. In addition to the Swallow-Tail Butterfly and the still larger Lime Swallow-Tail, we caught a brown butterfly the size of a Large Heath, with a brilliant patch of metallic blue, a new subspecies. There were also Small Blues and Long-Tailed Blues and Common Clouded Yellows.

In returning we passed a sun-bathed wall, the base of which was riddled with Jirds' holes; and the lucerne near was bitten off short. The damage the Jirds do must be a considerable loss to the cultivators. Several animals were on the move while we watched, but were very shy. Little heads were peeping out with beady black eyes and not much showing beyond the erect ears. This was sufficient to convince me that the species was wholly diurnal. Mehdi proposed to bring down traps in the afternoon, and we were starting for home when two men with a spade joined us, who were full of complaints against the "Jerboa," as they called them, although when pressed they admitted these were "*Jerdee m'al burr*," country rats, as distinguished from the real, long-legged Jerboa found in the desert. Jerdee alone is the Black Rat, an unclean feeder,

considered "haram," or an unclean animal, while the Jerboa is "halal" and therefore according to Muhammadan law can be eaten. Thus we find a good reason for the general grouping of the vegetable-feeding Jirds and Gerbils as Jerboa, for they can then be eaten without any twinges of conscience. The two men began to attack the wall with the spade and pull down whole lengths, but as no animals appeared, and as I was not sure whether it was their own wall they were demolishing, I left to prevent their pulling down the whole length, fifty yards or so. Their blood being up, the hunt was apparently continued after our departure, for on his return in the evening Mehdi reported that he found the entire wall levelled, and four specimens that had been killed in the scrimmage and discarded, while three more had been taken alive, and one man had cut their throats in the name of Allah the Merciful and taken them home to eat.

[*November 29.*] It seemed as if last night was more chilly than of late. Both days and nights since my arrival have been windless, an occasional breeze just moving the air. It is so hot in the sun in the gardens that one prefers the shade of a palm. Last night I was able to sit in the open veranda for two hours before going to bed, and did not feel the least bit chilly. My clothes, when I am not in Arab kit, have so far been a thin Norfolk jacket and grey flannel trousers, thin cotton shirt and drawers, and no vest. At night woollen pyjamas (winter weight) and four blankets. These are rather too warm, but two blankets got a little chilly towards morning.

Mehdi had been complaining of headaches, and his interior was out of order. I hoped we should both avoid the complications of illness. Probably he had not yet become accustomed to the hard water; it curdled soap very much and had affected me, but not inconveniently so far. We got our drinking-water from a spring, a man coming in twice a day with skins to fill up the earthenware vessels. Ample water was obtainable from the well at twenty feet

depth in the courtyard, but as it must be contaminated by town drainage, it was a relief that the powers that be did not consider it drinkable. Mehdi's complaint responded to the homely remedy of brandy; he demurred for some time, till I reassured him with the news that his Prophet had said it could be taken as medicine and had written it in the *Qurān*.

We passed through the Thursday market to-day and out into the gardens. The soldiers cast longing glances at Qusaibi's window as we passed by, but said nothing. Their idea of a day well spent was to sit there drinking coffee, chatting with new arrivals or idly watching the crowds below. Our escort had been made up by a soldier named Abu Saud, a merry scoundrel, who was more of a court jester than a guardian. He had a liberal mixture of negro blood, but being in a subordinate position he could not cause any difficulties, and his infectious humour kept everyone in a good temper. The live-stock market takes place on the plain outside the north-eastern gate at the same time as the other. Badawin, who shun the confinement of even an hour spent in a town, are everywhere among the herds of camels, sheep, goats and cows. Some very nice cows were to be bought, and some of the sheep were in excellent condition, obviously selected for the butcher. They are all of the long-haired, fat-tailed kind, either white or black-and-white, and are so like goats that it would seem the absence of the goat's smell would in some cases be the only distinguishing feature, if the tail were not visible.

The walk through the gardens was uneventful. A caterpillar of a large Hawk Moth was found in the lucerne, but could not be identified, and three Spotted Sand-grouse passed over from south to north at a great height—the first game birds to be seen. From Palgrave's description of the lakes I had imagined myself standing up to my knees in a reed shelter while a line of beaters advanced and masses of unsophisticated Ducks and other

water-fowl flew round me and fell to right and left, and had even brought 400 cartridges loaded with No. 4 shot specially for these battues, as no other writer on the country had said anything to disillusion me. After a fortnight's diligent search these Sand-grouse were the only birds worthy of No. 4 shot yet seen or heard, and all the cartridges of that size were taken back to England, with the exception of about twenty.

Muhammad Hasan came regularly after breakfast to know if there were any orders. I showed him the knife with many gadgets which I was taking as a gift to Faisal ibn Saud, the Sultan's son, and said with emphasis that I wanted to present it when I arrived in Riyadh, knowing that all my conversation was carried to the Governor. Next day I received a reply, for Muhammad Hasan in general conversation brought in a remark that someone had mentioned that there were no birds in Riyadh. I retaliated by saying that no Arab knew any birds but a chicken and a Houbara, and neither of those interested me. This is the approved way of carrying on a delicate negotiation in Arabia.

[*December 1.*] The gentle breeze from north-west and the bright sun would have made life very pleasant if only my plans for the future had been settled. Mehdi's indisposition was over, although he was still on a diet of fresh milk; he believed this had had most to do with his recovery, for when I claimed the cure for the brandy he said he was sick immediately after drinking it.

The Governor asked to see the skins of the animals that were pinned out to dry on a board. They were an object of wonder to the soldiers, who said they looked as if they were alive, and who had doubtless carried the news and excited the Governor's curiosity. It is small wonder that the collection of mammals has been neglected by travellers, even when they were naturalists, as it is more tiresome by far than that of birds. Not only must several days be wasted in trapping one particular place with an

even chance that Jackals will empty your traps or drag away your capture, trap and all, but the drying of mammal skins takes at least four days before they can be removed from the board for packing. If you are not limited in baggage this difficulty is overcome by having special cases with shelves on which the moist skins can be pinned and packed at once. The measurements that have to be taken of mammals, head and body, hind-foot, ear and tail, all take time to enter up, whereas birds require no finding of the millimetre scale or measurement, are easily shot on the march without any special delays, and can be skinned and packed at once and be depended on to dry and come out with a decent shape on arrival in England. For these reasons one may be certain on most journeys that the mammals of the country are not so well known as the birds, and a higher proportion of new species of animals than of birds is likely to be obtained.

The Governor examined every specimen carefully and asked what was inside them. I showed him the artificial body of cotton and explained that the skins had been washed with poison. He sniffed at them gingerly and seemed relieved that there was no smell but camphor. He himself was always surrounded by perfumes, not of flower essences, but the more elegant aroma of scented woods, such as incense, and I was surprised he took the risk of touching the skins. When coffee was called for, I asked him, rather bluntly perhaps, when there would be an opportunity of going on to Riyadh, and he merely said : " Did not Muhammad Effendi come and see you ? "

I said : " Yes, he came, but did not tell me when I could start for Riyadh."

There we left the matter for the time being. It was impossible to say what lay behind. It might have been that last year's drought was really the difficulty, or it might have been for political reasons, or again it was very likely he wanted to gain time to receive instructions from the Sultan.

There was great excitement to-day in the street opposite my window. People were shouting and running. Excited donkey-boys grasped their donkeys and led them helter-skelter down side streets, and everyone was craning his neck out of window and doorway. Wondering what could have caused such commotion, I also watched at the window, although my view down the street was obstructed by an adjacent house. After a long wait, during which my imagination had pictured at least a murder, there came the unmistakable toot of a Ford motor-horn, and a car rushed past, full to overflowing with Arabs and followed by an excited crowd of men and boys, running after it as hard as they could lay legs to the ground. Even women and girls, forgetting their usual decorum, were flying in its wake, veils streaming out behind. Although this was not the first car to make the journey across the sands, it was still sufficiently novel to cause a sensation where most inhabitants had not even seen a horse-drawn carriage. Two or three cars had recently passed through Hufuf on their way to Riyadh, where the Sultan was able to use them on the hard sandstone tracks and plains once they arrived; but they had to be dragged by camels across the forty miles of soft dunes between Oqair and Hufuf and again across the Dahana¹ sands between Hufuf and Riyadh, and a big Crossley touring car is reported to have needed forty camels to tow it across this barrier.

[*December 2.*] On the previous evening the wind changed from north-west to south-west, and the sky, which had been clear, clouded over and the air felt warmer.

We reached another scene in the little play. Each one occupied one day, and as they were disconnected the plot was for a long while difficult to follow and piece together. A nephew of Muhammad Effendi called to ask why I had not been to call on Muhammad Effendi at his own house. It was the first time I had heard he had a house,

¹ Dahana is the spelling used on maps, but the middle *a* is not pronounced in Hasa.

having conceived a vague idea that he lived with the Governor. I said that nothing would please me better than to come and see him. The time agreed upon was after the evening meal, when the old gentleman held a reception; his secretarial duties must have occupied him fully all the rest of the day. I spent the interval in working out the latitudes and longitudes from observations already taken. My staff seemed to be taking much interest in the call, and all severally and individually offered their services to show me the way, so the Effendi's establishment must have had a reputation for excellent coffee, as there was no other obvious attraction. The choice of escort was left to Muhammad Hasan, who took Saud and one of the other servants to walk in front with the lantern. I was beginning to manage my skirts much more skilfully than at first, but the roads were uneven from the constant wear of the donkeys' hoofs, and when one wears soft shoes, one is liable to strike the side of one of the holes and twist an ankle; so the lantern was a welcome addition. It was most picturesque walking through the silent streets, now almost deserted. The way led past the open stable, where the quiet munching of lucerne and an occasional sneeze from a horse denoted that all was contentment there. Six armed men were on night duty with this stud, but we only saw one, who emerged out of the gloom into our lantern-light, stared at us, and on recognising the soldiers disappeared into the darkness.

The Effendi's house was in the north-west quarter of the Kut, and the houses we passed were larger as befitted the residences of Officialdom. The streets here, as everywhere else in the town, were in a chronic state of disorder—a similar complaint is often levelled at the authorities in London—but in Hufuf it is house repairs that cause the obstruction, and we were again glad of the light from the lantern to avoid falling over mounds of earth or heaps of rock shot in the pathway. I laughingly told the soldiers that their townsmen spent their time in

fetching these mountains of earth and dumping them on one road, then next day another army of donkeys would move them to another street ; and to a stranger this seemed to be what was actually happening.

My host was seated alone on one side of a long guest-chamber, while the other three walls were crowded with friends, who came and went. There was apparently no one of sufficiently high degree to be seated even on the same line as the Effendi, and he had probably commandeered any subordinates available to give the right effect on my entry. The soldiers joined them, and I was given the place of honour beside him. The old man was quite charming and we chatted away gaily on Mosul, his birthplace, and on agricultural subjects, especially dates. He said the Hasa dates were equal to any in the world, but his people did not understand grading and packing them. He asked many questions about English road-making and waterworks. Possibly, with the advent of the motor-car, he foresaw the problem of road improvement on the horizon. He also said that not infrequently shocks of earthquake are felt in Hasa. At the far end of a dark passage the coffee-hearth was visible, lighted by the red flicker of the flames, where several slaves hovered round a row of big coffee-pots. Tea arrived first, and then the coffee made from the berries of Yaman.

It seemed more courteous not to mention the matter of my journey, but to allow this to be regarded as a polite call, and the crowd of people made it impossible to exchange a few words privately, so I suggested a visit on the morrow, and he said he would prefer to come and see me the next morning. As I rose to go he held me back for the final ceremony of passing round the incense. The little brazier is brought by a slave to the host, who unrolls a wallet from his pocket, selects a small bit of the fragrant bark, drops it on the live embers, and blows it to a glow. He then wafts the fumes towards his face with his hands, sniffing and snuffling, and

finally envelops the whole brazier in the loose folds of his *kafiyya*, confining the smoke round the beard. The brazier then passes round the assembly, who all do likewise. Twice or three times it circulates, and then the guests are allowed to depart. He said that the incense came from the Hejaz. The order of drinking coffee is a strictly-observed ceremonial, as it grades the precedence of the guests in the eyes of the onlookers. Muhammad Effendi insisted on my taking the first cup, although I went through the formality of waving the cupbearer towards him. On the other hand, Shaikh Abdulla, the Governor, as representative of the Sultan, was taking no chances. When I called on him, the slave offered it to him first, and he drank before me. If I had been there officially, that is, representing my Government, he would have insisted on my drinking first, as being the guest. The Sultan himself or his sons would drink first in any case, unless their guests were rulers of equal status.

[*December 3.*] The sky was flecked with white cloud. The Effendi came early for our private conversation. Muhammad Hasan came up immediately behind him, and entered the room much as a friend of the family, evidently consumed by curiosity to hear what we were going to say, and looked very disappointed when I told him he would be welcome later. Having at last obtained the privacy I desired, we were settling down to talk when Abdulla Effendi was announced. Not having any idea who he was, and being determined at all costs to have the interview to ourselves, I was inclined to keep the new arrival waiting. However, the old man seemed anxious that he should come, so I relented, and, to my amazement, in walked Dr. Abdulla, an old friend whom I had met on many previous occasions in Baghdad but had failed to recognise under his Hufuf name. He was a Mosuli by birth, who received a medical education in Constantinople, but had now abandoned medicine for politics, and acted as the Sultan's Secretary of State for Foreign Affairs. He was, in fact,

passing through from Riyadh to Kuwait to represent his master at the Kuwait Conference, and made a most welcome party to our discussions. Hufuf was now his home, and he had married a daughter of Muhammad Effendi, but he could have little time with his family except for flying visits such as this, for his ambassadorial duties kept him travelling. He was thirsting for news of the outside world, as all his newspapers had miscarried, but since mine had done the same and we neither of us could exchange or discuss matters that were not already public in the Press, we could contribute little towards each other's enlightenment. He produced a box of gold-tipped Egyptian cigarettes, a poor substitute, I felt, for Muhammad's fragrant incense of the night before, and as Muhammad did not smoke, I was relieved to think that the owner of the accursed weed was not only the accredited representative of the Wahhabi Sultan, but was also the close relative of my guest.

Abdulla had read Sir Percy Cox's letter to the Sultan and had apparently conveyed official instructions to the Governor as to my entertainment, and I noticed a distinct change in all my dealings with officials. The soldiers confided in me afterwards that their purport was that I was to be treated with the greatest honour. Abdulla, who spoke with inspiration from Riyadh, seemed to think that after a month or so there would be no difficulty in going on to the capital; but there was at present a scarcity of food. Every animal that could be spared had already been sent a hundred miles north to feed, and many had died owing to the drought in the south. It was suggested again that I should take the road to Kuwait until rain fell. I asked if the Sultan had said that the Jabrin journey would be possible, as Sir Percy Cox had already sent a collector who had spent several weeks in and around Kuwait. Although Abdulla said that Jabrin would be possible, the cute old gentleman, who had listened quietly, did not concur, and said he would have to ask the Governor.

My interest in Riyadh faded rapidly when Jabrin looked like being a possibility, but if both could be arranged so much the better. I explained that I was carrying a letter from Sir Percy Cox to the Sultan and was determined not to leave until I had delivered it into his own hands. Abdulla quickly asked if it contained any official communication, and I said no, it was only a private letter, but I would not trust it to a messenger. This was my only slender anchor, in case it was suggested that I should finish my activities in Hasa and return to the coast. Abdulla's news of the Sultan was that he had caught a chill in his eyes and face and had been attended by an American doctor who was on a visit to Riyadh from the American Mission at Bahrain. It was not serious, and he had almost recovered when Abdulla left.

The two departed together, and Abdulla promised to return, but he went off to Kuwait early the following morning, doubtless disappointed that he had not been able to persuade me to come as his companion on the road. I spent the day preparing to shoot Bats when they issued from the roof in the evening. The charge was extracted from .410 cartridges, and a quarter of the original powder and shot returned with the wads. The superfluous length of case was cut off and turned over, and I hoped to be able to shoot them at a distance of ten feet without damaging the bodies, as they paused for an instant on settling on or taking off from the beams. It was not successful, as a very little powder blew them to pieces, and if the powder was insufficient to clear the central felt wad from the barrel, and this passed unnoticed, the next cartridge might cause a burst gun-barrel. As it got darker I fixed a piece of white paper to the foresight to help the alignment, and sat with the lamp behind me. This passed away many of the evenings and was as entertaining as sitting up over a kill for bigger game in India, for I was now certain that my quarry would prove to be new, which made up for its more modest proportions.

We wandered outside the town at sunset to await the appearance of Bats in a place where they could be shot at with a twelve-bore without peppering any of the faithful. There was a pale, rather large Bat with low-flying propensities. Indeed, it was the most difficult of all to shoot, as it never appeared against the sunset sky or above the skyline, and in the half light it caused one to waste a lot of cartridges. As these Bats did not come from the town, it was almost certain they came from the hills some three miles away. They proved to be *Asellia tridens*, identical with the Bat from the Tombs of the Kings in Egypt. The other species, small and plentiful, seemed to be the same as those in the roof of my house, and this Bat was the Pipistrelle, which I have named the Ikhwan Pipistrelle.

[December 5.] The day was fully occupied in working out longitudes. The absence of wireless was a great drawback, as these observations are entirely dependent on the time, and my times were entirely dependent on my pocket chronometer-watch. If you can get a wireless signal, you know exactly at what rate a watch is gaining or losing, and can estimate the exact instant at which the observation was taken. The only method open to me was to find out how many seconds my watch was losing per day when I left the British India steamer. That was kindly done for me by the Navigating Officer, and I assumed that it had continued to lose at the same rate for the three weeks that had elapsed since disembarking; if it chose to alter its rate and keep exact time, or even gain on Greenwich Mean Time, any calculations based on its losing were bound to be out. My only check was to find out its difference from G.M.T. as soon as I once more embarked on leaving the country, and average that over the number of days that had elapsed, in my case some four months.

An extreme case may illustrate the difficulty. On leaving the ship my watch might be right with G.M.T. for three consecutive days, which would mean that it was not gaining or losing. On landing, the change of tempera-

ture starts it losing two seconds a day, let us say, and in 90 days it is 180 seconds or three minutes slow; at the end of my journey, therefore, a longitude taken has three minutes' error in the time. On the return journey the watch begins to gain two seconds a day, till in another 90 days, on reaching a ship once more, it is exactly right, and it might be assumed that the watch had been showing correct G.M.T. throughout the journey. The error would have grown, and then corrected itself in the same way, and so gone undetected, whereas a wireless time signal obtained after the first 90 days would have shown the watch to be three minutes slow when the observation was taken. The difference between the exact time at the position and the time at Greenwich at the same instant gives your longitude east or west, according as it is earlier or later than Greenwich. But the time correct to a second can only be obtained from the angle of the sun or stars, which has to be measured with a theodolite or sextant at the same moment as you take the time. Latitude is obtained by much the same process, by reading the angle made by the sun when on the meridian, or the altitude of the Pole-star, and your position is ascertained by making the necessary calculations by trigonometry. Perhaps neither the taking of the observations nor the computations afterwards may seem very easy, and they are not as easy as they seem. Opportunities of getting out all the instruments during real hard marching are few and far between, and the general direction and position of landmarks can only be ascertained by the less accurate but much more practical prismatic compass. This entails a constant series of observations at about ten-minute intervals all the time you are marching; however, I found it possible to take readings with an Army-pattern prismatic compass with sufficient accuracy without stopping the camel, and also to print the notes and figures in the note-book on the move so that they were legible. The compass that should be carried for camel marching has the needle floating in oil,

and is not so susceptible as mine was to the constant jerks and heaves of the beast under you.

Having got the direction, or the number of degrees from north you are travelling, it remains to know how many miles you have covered in that direction, and here the chronometer-watch comes in again. By writing down the time when you start and the time when you stop, also the time of the beginning and ending of short halts, say for coffee or shooting a bird, it is possible to know how many hours and minutes were actually spent in marching. By estimating the number of miles per hour you were travelling by the most accurate means at your disposal, the various distances are calculated, and if you can spare time to obtain your positions astronomically every few days, the journey can be corrected by them with very little error. Heights above sea-level are known by noting the reading of an aneroid barometer, and as a check on this water is boiled in a hypsometrical apparatus and the temperature at which it boils is written down.

Enough has been said to make it evident that a traveller's time is fully occupied if he means to bring back information of any value. This is in addition to the ordinary occupations of the road, such as picking up fallen camel-loads and so forth, and it can be realised that on reaching camp it is a long time before there is an opportunity of resting, however tiring the day, as there may be an hour's skinning of birds and animals, followed by the writing of labels and entry of each specimen in a book. Reptiles have to be put in spirit and labelled, flowers placed in a blotting-paper pad with labels. The small field-book has to be gone over and touched up when the scrawl made on camel-back requires it, and then the diary, unless it is written up every day, may as well be given up altogether, as there is nothing so easy as mixing up the dates if the entries for several days are at all postponed.

My first mail arrived to-day by messenger from Oqair with letters and three numbers of the *Weekly Times*, two

dated October 18, and the other October 25, so owing to the carelessness of the agent I only get two after all this long wait. In order to clear my head of sines and cosines and the brain-curdling conundrums connected with my computations, I took a gun and sat outside the town on a garden wall at the sunset hour. It was almost deserted at twilight, as everyone had turned into the town to pray. We saw a party of twenty men coming across the plain and wending their way towards one of the gates. Two well-dressed Arabs were in front, one of whom I was informed was the Governor's eldest son, Fahad ibn Jiluwi. The retinue had about ten falcons between them, both Sakir and Peregrine. Behind was a slave with a pack of Salukis, both old dogs and puppies. All Salukis here have smooth coats and therefore resemble more closely the English greyhound than the Iraq Saluki. The predominating colour among Ibn Jiluwi's pack was smoky grey, almost sand-colour, though one dog was black-and-white. The Shaikh of Bahrain tells me that pale Salukis withstand the summer heat better than blacks.

It is a wonderful half-hour that follows the sinking of the sun. The bells of belated donkeys tinkle as their riders urge them to the gates, the sky changes from red to sea-green and silhouettes the grey-white town, faced with its twenty-five-feet high mud and stone walls with the turreted forts at intervals. Above all rise the minaret and dome of the mosque. A Bulbul singing in the distance is very like the Nightingale. It sings and pauses in much the same way, but has not the rich variety of notes. Then the wild melody of the Governor's camel herdsman is heard as he sings to the unresponsive cattle he is escorting from their daily excursion to some very bare bush-country about eight miles to the south. His voice is much like the cry of a huntsman, varied by outbursts of two short bars of wordless song, always the same, of which he never tires, and it has a haunting cadence all its own. It grows nearer, and at last he rounds a garden wall astride a black

curly-coated camel, and behind him stream seventy to eighty more fine beasts of the Governor's herd, both old and young, and, of course, with only one hump apiece. The two-humped monstrosity is unknown here and would certainly not be called a camel. Unfortunately, in children's books, the Bactrian two-humped animal figures as the camel, on what authority I have never been able to discover, whereas the pride of Arabia and Africa and the steed of the Camel Corps has but one hump. Some of the herd stop with curiosity to sniff and poke their noses towards some of the heaps of straw which, they think, have been left unguarded round a rice-threshing floor out on the plain; but the owner appears from a little booth and they gallop off with shambling gait to catch up the rest, some of the younger ones even giving an exhibition of buck-jumping, or as near as a camel can get to it. Then two Swallows flit over the town wall, catching one last fly in the afterglow, and after them come the Bats. In a far-distant garden the first Jackals are wailing like lost souls, and the voices of a hundred men, each on his house-top, are saying the *Adthan* or Call to Prayer. It comes to us blent by distance into one voice, a veritable surge of sound. Some of the Hufuf people relieve the monotony of the *Adthan* by intoning it, and some transposing of the words has been noticed. This reveals a tendency towards ritualism as well as the tolerance shown by the present Government in religious matters. The time specified by the Prophet for the *Adthan* is when a black thread cannot be distinguished from a white one, and it was usually the signal for me to take the cartridges from the gun and return home.

As we approached the gates, a Bat of a larger species than I had ever seen (with the exception of Indian Fruit-eating Bats) left the town and flew with a slow flopping flight to the gardens. I went and waited where it had crossed in case any more were coming, but nothing appeared until it was too dark to see at all, and I strolled

homewards, resolving to wait for it on another evening. The next day we were waiting at the same place and same hour, making sure that if it crossed at the same place it would have the light of the sunset sky behind it. Punctual to a minute and coming on exactly the same line, came the strange ghostly figure, offering an easy shot. The soldiers and Mehdi rushed to the spot, but I got there first. It was quite as peculiar as my fancy had painted it, with long transparent ears and wings and pale grey fur, a veritable Hobgoblin. It proved to be a new species of a very rare genus called *Otonycteris*, represented by only six skins in the British Museum. Very well satisfied with the evening's hunt, we returned.

[December 7.] The morning was cloudy with patches of blue sky. Clouds were travelling very slowly with a gentle south wind. Clouds always seem to accompany a south wind. A bright rainbow (Arabic *qaus-i-quzah*) appeared against a cloud in the northern sky. Thirsting for more of the big Bats, we took up a position to watch the opposite or north-west corner of the town in the evening. It looked as though we had drawn a blank, and I had emptied the cartridges from my gun when one came over in much the same leisurely way as the other had done, and flopped off to the gardens.

[December 8.] A windless day without clouds. Two large flocks of Starlings flew over the far end of the town, birds it would be most interesting to secure if they would only pass the same way at the same time for several days, but this was the first and last appearance of Starlings in the oasis. This place has indeed a remarkable fauna. It is difficult to say which is the more unexpected, the absence of winter visitors or that of residents.

Soon after breakfast Muhammad Hasan came in to ask if I would like to see Shaikh Abdulla. I replied that I should be delighted, as an inquiry of this kind was sure to be inspired. He went off and returned to say that he would receive me at once. This meant a scramble to get

into Arab clothes, and we took with us the board with three different species of Bats pinned out to dry.

Shaikh Abdulla was in the middle of his morning's court, and Muhammad Effendi, seated on his left, rose to make room for me. The room was not crowded, and a case was proceeding during my interview. Occasionally a witness came forward and gave some evidence, the thread of which I was unable to pick up. The Shaikh seemed more inclined to talk than on our previous interviews, and I accordingly stayed longer than I had done before, till a second round of coffee had circulated. He looked intently at all the Bats and asked if they were all shot flying, which, being an art of which the Arabs know nothing, seems to impress them more than anything. As he did not broach the subject of my departure, I also said nothing, though long afterwards, in reading over my diary, I think I was expected to mention it on this occasion; still, postponement of a negotiation even at its most critical stage is pardonable or inspires respect, whereas what the Americans would term hustle would be considered unmannerly. I could afford to be very mannerly while there were more specimens of the Hobgoblin Bat still to be obtained.

Hufuf cats had a lesson in mechanical science during the week. They had been a great nuisance from the first, quarrelling and fighting in the courtyard, and lately they had invaded my room in search of the specimens of Bats and birds that they could smell. Eastern domestic cats have a much more highly-developed sense of smell than the Western. The limit had been at last reached, one of them having jumped on me in bed the night before. Mehdi was told to bring me one of the smallest break-back mouse-traps, as I did not wish to injure my neighbour's cat, and it was baited with meat and tied by a long string to the far end of the veranda. My lamp had hardly been put out when I heard the sharp click of the trap and the hurried retirement of the terrified tabby. It simply thundered past my door, leaped the wall, and must have cleared the

narrow street to the house opposite or fallen into the road below. I re-set the trap : in a quarter of an hour there was another stampede, and yet another the following night. The trap was just strong enough to give them a sharp tap on the nose as they grasped the meat, and the surprise had such a lasting effect that I could even leave my specimens about, and never a cat came near the house to disturb them.

I spent some time in writing letters for home. Even my mails were sent and delivered by the Governor's staff. They despatched and delivered them without any delay, but they got a little mixed over envelopes addressed in English, as there was an American doctor at Riyadh. Since no one could read the envelopes I generally got both and had to sort them out. There were very few people in Hufuf who could even read Arabic, and I could just read enough to avoid opening the official documents addressed in Arabic to the Sultan that were brought to me occasionally in error. The Hobgoblin Bat did not appear that evening, although we waited till it was too dark to see it if it had appeared.

According to Muhammad Effendi's description of the summer, it is hot but temperate compared with other places round, and there is no sunstroke. Mosquitoes are supposed to be plentiful in the gardens in summer.

[*December 9.*] At sunrise a cloud of fog covered the town so that objects were invisible at 300 yards. The sun, which rises at a quarter to seven and sets at five, local time, rapidly dispersed it. We were rewarded for our disappointment of yesterday by obtaining two of the Hobgoblin Bats. They came out at exactly the same time as two nights before and took the same course. They must be very scarce, as this made only three seen in all our careful watching.

[*December 10.*] There were six Duck flying round the gardens early in the morning, too far off to identify the species, but they looked like Shovellers. As this was the

first and only time Wild Duck were seen in the oasis or, indeed, in the interior, the event was more noteworthy than it may seem, more especially as there are so many shallow lakes and reed-beds which in any other country would be alive with wild-fowl.

I thought it would be as well to go a step further with the plans for my future travels, so I suggested to my soldier that I should pay a visit to Muhammad Effendi, with the intention of hearing what had transpired since he left me to ask if I could go to Jabrin. Within a short time Muhammad Effendi was announced, having evidently come hot-foot from the Governor. I curbed my impatience long enough to go through the usual polite speeches, and also to allow him time to recover his breath after mounting the stairs, and then asked what Shaikh Abdulla had said, and he replied equally tersely that it would be all right. This was good news indeed, but it was not to be considered as a certainty. There were still many possibilities of an alteration or even cancellation, although "yes" from Shaikh Abdulla meant more than it does from most men. Fearful lest there might be conditions to follow, I went on hastily and asked if he, Muhammad Effendi, had ever been to Jabrin, but he had not, and for a Government official his knowledge of the place was curiously small. The authorities seem to have relied entirely on the tribesmen's descriptions.

He told me it was a very unfrequented road and more beset with difficulties than the Oqair, Riyadh, or Kuwait roads. The Al Murra tribe (a single member is called a Murri) only go in to the oasis to snatch the dates at the time of harvest and depart again, fearing, as he said, the fever that is prevalent among the trees if they should stay there. The ruined town was haunted by "jin," spirits that were heard moaning round the walls and appeared before anyone who was ill or weak. The place has not been inhabited for a period that he estimated at 600 years. The springs were supposed to be fresh and sweet, with

water running from them over the surface of the ground, making water-lifts unnecessary for irrigation. (It will be seen from my own description of the place that the wells were not flowing and there was no evidence of water-channels to suggest they ever had been.) He asked if I had any books describing Jabrin, and I said no, absolutely nothing was known of it. There did not seem any possibility of finding out much about it before I started, since the Government were satisfied with hearsay and fairy-tales regarding it. I suggested that as it seemed such a troublesome expedition for them to organise, I had perhaps better hire my own camels and make my own arrangements, if Shaikh Abdulla would exercise a certain supervision and recommend a guide. To this he said without hesitation, no, Shaikh Abdulla would not agree to that. He then left with a promise that, when arrangements were further advanced, he would give me two or three days' notice to prepare.

My efforts to find out more about the mysterious Jabrin were very unfruitful. Abu Saud, one of the soldiers, had been there, but had a very vague idea of what he saw. He had passed by in a raiding party sent out by Shaikh Abdulla some years ago, probably to punish and check the onslaughts of Oman tribes, for the party got into their territory, but the men were always reticent about any of these political excursions, and I did not wish to show undue interest in them.

[*December 11.*] The butterfly-net was a most efficient protection against house-flies. An occasional slaughter cleared the room for some time, otherwise they would have been a great nuisance. I spent most of the day with the theodolite. My interest had been revived now that there was a good possibility of using it in Jabrin, and it was most essential that everything should be in perfect order when we started, although the large box in which it travelled came in for a fair share of bumps and falls that would have given an instrument-maker a heart attack,

had he but seen and heard them. The three-inch theodolite is not nearly so easy to read accurately as a six-inch. I was able to correct mine with a few simple adjustments, but was afraid to be too venturesome lest worse might befall. I took observations for latitude when the sun was on the meridian, and had a lot of trouble to get the levels right; at the moment of reading they were generally out of centre, and the observation had to be taken again. In the evening Capella and Deneb, east and west respectively, and Polaris were seen. The longitudes from Capella and Deneb were only six seconds in time apart, but we still had the chronometer to contend with. It was probably keeping even time, but there was no way of knowing until we once more reached a wireless set. These pocket watches only have a 24-hour limit for winding, and they certainly should have at least 48, as if you are unable to get to your watch one night, or have an attack of fever, or even forget on but one occasion, your watch has stopped by next morning, and the consequences to your work are serious. I got over the difficulty partly by winding twice a day, and on the one occasion on which I forgot to wind it at night it was still going in the morning, and the position was saved.

I had only seen five of the Hobgoblin Bats and got them all, and it was surprising to find them all males. I told Muhammad Hasan that the only explanation for this was that these must be the soldier Bats. He said next day that he had repeated this to Shaikh Abdulla, and he had been immensely delighted with the idea, had thrown back his head and roared with laughter. It was a trait in Jiluwi's character that was new to me; I did not know he was capable of such abandon.

CHAPTER XI

LIFE IN HUFUF (*continued*)

[*December 13.*] The soldiers had been a willing and uncomplaining escort, and by way of reward I expressed a desire to see the Thursday market from Qusaibi's office window once more. They heard the news with unconcealed joy. We had hardly settled down there when a well-dressed young merchant joined us, and, seating himself next to me, made a remark, little suspecting that I was anything but another Arab. My reply at once disclosed my identity, and he gave an unconscious glance at my feet to see what was my nationality. I suppose they can tell by the colour : a European would have very white feet, or if they were covered the boots would be recognised by their make. My shoes did not give much enlightenment, however, as I was wearing the Persian *ghiveh* of white, closely-woven cotton. He then asked if I were a doctor. The majority of recent Europeans seen in Hasa have been doctors. I said no, I only understood doctoring myself. Muhammad Hasan then carried on the conversation, thinking some explanation was required, and described me as a "Sahib al ghunus," the nearest interpretation being a "master of hunting." This was a splendid professional title, as no one had ever heard of one before, and it was bound to be satisfactory, more particularly as I was always to be seen with a gun. I often heard Muhammad plied with questions in stage whispers afterwards when he met a group of friends. "Is he a doctor?" "No." "Is he a Political Officer?" "No, he is the hunting Sahib," which entirely satisfied their curiosity.

Later on, Abdulla Qusaibi, a partner in the firm, came

up to greet me. We had last met at the Carlton Hotel in London in 1919, when he was in England with the Najd Mission, led by the Sultan's young son, Faisal ibn Saud. We had forgotten each other, and it was unlikely that he would remember the features of a little-known man he had met in Europe, even without my beard and Arab clothes. When that former meeting was recalled, he sent off for a box of treasures from his home containing a leather despatch case packed with photographs of himself, picture-postcards, and illustrated newspapers with photographs of the Najd Mission in England. What he wanted to find were the Carlton Hotel menus signed by the guests at the various parties. I could not remember signing one, but he burrowed among the papers, showing me menu after menu, until almost at the bottom there appeared one with my signature. His delight knew no bounds. As he put it, we had been friends for five years, and I heard next day that he had gone to tell the Governor about it, and my importance had been much magnified by him, as indeed it was bound to be in order to impress everyone with the high position of all who were asked to meet his party in London. His collection of works of art was an amusing mixture of picture-postcards of towns and coal-mines with some appalling coloured cards of women in undress, luckily all perpetrated in Brussels, which he had been given during a tour of the Continental battle-fields. I blushed when these were passed round in such an assembly, but regained my composure when I saw the cards were examined sideways and upside down and were admired as landscapes.

Another post arrived during the day with an *Ibis* and *Royal Geographical Journal*, and a form from the War Office asking for my date of birth. Being so far removed from the family Bible and having my mind distracted in many other ways, I could not be sure, and had to reply that I did not know it.

[*December 14.*] I took Capella and Deneb again last

night and worked out the longitudes to-day, with even better results, as the difference between them was only a small fraction of a second. This was not only satisfactory as fixing at last the position of Hufuf, but showed that the theodolite was in order for Jabrin. Rain clouds were gathering and spoilt my chance of taking the altitude of the sun on the meridian, although I had all the paraphernalia out ready. Afterwards two small showers fell, not enough to lay the dust; there was a lot of lightning on the horizon to the N.N.E. after sunset. This would be on the coast towards the Persian Gulf near Qatif. They often appeared to get rain in that quarter which missed Hufuf.

We saw a few plants of cotton in one of the gardens (a fuller description will be found in Appendix VI), but observed no attempt to grow it systematically—nothing more than a few plants in irregular rows. Cotton is imported in large quantities to Hufuf via Bahrain, as the local-grown crop is inconsiderable. The best quality is said to come from Persia via Mohommerah. Samples of a very white cotton of soft texture were brought from the bazaar. The second quality comes from Karachi, and the sample was the worst I have ever seen. It seemed to be the refuse of the fields, gathered after the rains had fallen, and I should have thought it would have been valueless anywhere. Both kinds are used for stuffing cushions.

[*December 15.*] I missed the sun on the meridian again to-day owing to a miscalculation in the equation of time. I got my first observation a little late, and I think the sun was just beginning to fall again. Work of this nature is full of traps, and the slightest thing makes the whole operation null and void.

I had begun to extend my walks outside the garden area. To-day we reached a sandstone plain on the road to Mubarras. There was a drainage basin in the hollow from the gardens, watered by another spring, the water covering about ten acres. There seemed to be a lot of waste of irrigation water, and so indeed there usually is at this

time of year. It must be remembered that in the summer not only would the dates and lucerne require more, but the rice lands would use an enormous amount, and it is probable that every drop of water would be used, and suggestions for increasing cultivation which did not consider this would be doomed to failure. There was a quarry on this plain, where men were levering out square blocks of white stone for building. Flocks of Short-toed Larks passed us to drink at the edge of the lake and returned, and a Crested Lark was heard; though I searched the sandy wastes from which the sound issued it was not to be seen.

[*December 16.*] We explored the Khadud spring and the gardens, lying east of Hufuf and separated from the Oqair Gate by a mile and a half of sandstone plain. Close to the entrance to the gardens a small spring named Umm al Jamal lies near the path, and, as in the case of all these springs, bubbles up into a deep basin. On peering into this basin I had my first view of mature fish, about three inches long, and I noticed also that all I had hitherto been at pains to catch and preserve were merely young of little value. The big ones kept down at the bottom, and there were also many shoals of young fry, and while it was clear that the old fish had to be caught somehow, it was also evident that the young would prove my greatest difficulty, as an attempt to catch the big fish with a small hook and line would end in the capture of nothing but endless little ones. One of the men threw a piece of date in the water, and it was immediately surrounded by hundreds of little fish, pulling and tugging in all directions. It was soon demolished, and the bigger fish hardly secured a morsel. Quite close on the right is the Khadud spring, very much bigger, probably the biggest spring in the Hasa. It comes swirling up from a chalky sandstone crevasse large enough for a horse and cart to sink in out of sight without touching the sides. A man bathing in the lukewarm water dived and sank half-way down the chasm and picked up

a rock, the whole operation being clearly visible in the crystal waters. He next sat on the side with his legs in the water, and swarms of the small fish came and nibbled at his legs. Water from the spring leaves the pool by one outlet. A river some thirty feet wide with a swift current carries away the overflow.

Muhammad Hasan suggested that we should go on as far as a large garden owned by the Qusaibi family, which he said was only ten minutes' walk further on. After trudging for half an hour, he began to ask the passers-by, and each one said it was about ten minutes further on. We eventually gained the doors after about four miles' tramping, and were very glad of a rest in a garden-house that had been recently erected in the modern style of architecture. It was not used as a residence, but there were two stories. The upper contained rooms where the family slept for an occasional night or two, to escape from the cares of office. The chief room was a large lobby open on one side through stone arches to the garden, and fitted up with masonry benches for guests to recline on. Below the house was a large room with a warm spring flowing through the middle, fitted up as a bathing vestibule with stone pavements on which to sit by the water's edge, and an array of picturesque urns with which to pour the water over the bathers, while for the more venturesome steps led down into the spring.

The youngest Qusaibi Sad happened to be there, and rated Muhammad Hasan soundly for not having given him a warning, so that he could have prepared a meal. I explained that we had only come to find the way and would come for a meal another time, and meanwhile desired nothing but a cup of coffee before we returned. With characteristic hospitality he offered us donkeys to ride back on, as the road was long, and secretly sent a messenger into Hufuf to bring out food, delaying the arrival of the coffee to keep me there. After an hour he saw that I was impatient, and the coffee came. Little white donkeys

with the simple side-saddles on which everyone travels were ready for all the party, and we jogged off at an easy tripping gait at six miles an hour. There are no reins; steering is accomplished with a stick, and taps on the donkey's neck guide it to right or left, but I never quite grasped how it is stopped. At the gate we met the results of the conspiracy—a donkey and man laden with good food, at which the soldiers cast longing glances, as they were probably accomplices; nevertheless I kept on and they had to follow. A mile further on we met Abdulla Qusaibi coming out on a fast donkey. I felt sorry now and would have liked to stop and explain, but my donkey decided it for me. I was quite incapable of checking it at short notice.

The Reziz date tree is mostly grown in these eastern gardens. Magnificent specimens of palms they are, and seem twenty feet higher than the average Shatt al Arab trees; they are well tended and trimmed of the dead fronds. Rice lands predominate at the expense of lucerne fields towards the lower levels. Men were breaking up the stubble from which the rice had been recently harvested with large chopping-spades, leaving the clods heaped in parallel ridges to aerate and dry, after which they are again broken up and levelled, some being transplanted with onions as a catch-crop.

[*December 17.*] The wind was in the west. Some heavier showers fell and more than laid the dust. It looked as if showers were falling at all points of the compass in the distance, so I was hoping they would be sufficient to start the vegetation. I had to send Mehdi to bed with a dose of quinine; he had signs of fever, and I was afraid of an attack of malaria just when all was ready. I saw more bird life round the shallow lake to the north than any day before—a Raven, a flock of Spotted Sand-grouse, and several flocks of Short-toed Larks, coming and going to and from the water. A party of 100 Kentish Plover and a few Little Stints were feeding along the shore, and I

shot a female Desert Wheatear, the male of which is much more often seen. The Crag Martins displayed a great dislike for getting wet. At the first few drops of a shower they made for the towers of the Kut and clustered together in a huddled mass under the shelter of any overhanging piece of the mud walls.

[*December 18.*] A sunny morning; the rain-clouds of the previous day had gone. I made some fishing tackle with fine string, with intent to capture the adult fish. The hooks were entomological pins bent round so as to make them just too big for the mouths of the small fish. Shot were taken out of cartridges and cut almost in two, and pinched on to the twine. The hooks had quite the correct slant at the point, but I could not manage the barb. Mehdi, who had recovered, took the tackle down to show the local anglers; never having seen anything like it before, they were very scathing, and condescendingly said they would show us the way. I took some raw meat and dates for bait, and arrived in due course at the Umm al Jamal spring where the big (?) fish had been located. I tried first with date. We counted about six large fish in the pool, but my date never reached one of them, being torn to pieces by the small ones. It was just like a game of Rugby football. I could only tell where my bait was by looking where the scrum was thickest. I next tried raw meat tied on with cotton, and though the fight to obtain it was even keener, they could not worry it off the hook. At last one of the big fish was seen to rise from the deep water and join the scramble; but so nimble were the small fry that it was some time before he could see through the crowd and get a view of what the commotion was about. Then there came a moment when the big fish lay complacently in the middle of the host, and there was a sudden cessation of the dashing to and fro. I guessed that he had swallowed the bait and gave a gentle pull; he began to come and was soon grassed. The same bait landed four of the six, and we caught the other two afterwards.

Meanwhile, the rival anglers were still busy with a basket they were weaving with the leaves of date-palm, and, as might be expected, the larger fish were much too wary to enter it. However, they managed to snatch up a lot of small fry. The fish I caught were larger than any other specimens of the species in the British Museum. Most of the other collectors probably experienced the same difficulty as I had with the small and half-grown fish.

December 19 was spent in getting the first box of specimens listed and ready to send to England. It had been packed for the last three weeks in expectation of a hasty departure which seemed as remote as ever, and most of the spaces previously filled with paper were now occupied.

It was marvellous how much the small ants that lived in a crevice on my veranda could store away. I often caught 100 flies during the day and they were thrown down beside the nest. In an incredibly short time the wings were bitten off, and the fly's head and body separated, one ant going off with each. There was often a block at the entrance, which was narrow, but in an hour's time not a fly's body was to be seen, and however many bodies were thrown to them there always seemed to be unemployed ants to deal with the spoil.

[*December 21.*] Bright sunshine prevailed. The wind was north-west, but only a gentle breeze. There was so little movement in the wind on most days that it was not possible to note its direction. Later in the day the breeze increased and became rather unpleasant in the afternoon, when dust began to fly and found out the gaps in doors and windows. I went to the other spring, Umm al Khorasan. The fish were of the same kind, although there is no connection between the waters of the two springs.

The temperature of the water on the edge of Umm al Khorasan pool was 88° F., and must have been over 90° in the centre as it issued from the ground, the atmosphere being 61°. The fish were preserved in spirit in two ways in order to discover if possible a method of retaining the

colour, which faded quickly. I used ordinary trade methylated, undiluted with water. One lot were put in the spirit and not removed, the others were put in for five minutes and then taken out and allowed to dry for half an hour before being returned to spirit. Those that were taken out and dried seemed to retain their colour best. Both lots were kept in the dark as much as possible. The stomachs of the fish were gashed with a penknife to allow free entrance of the spirit. When they were packed after three or four days, all the spirit was run from the bottle, and the empty spaces in the bottle were filled with cotton wool, saturated with spirit. This kept the fish moist and avoided any danger of leaking, and they arrived in England in good condition. Wide-mouthed bottles were obtained in the bazaar, but stoppers presented a difficulty and corks were unobtainable. When we got some wooden stoppers turned in the bazaar, they proved porous and leaked badly, and we finally had to make them spirit-proof by frying them for five minutes in candle wax.

There were a few leeches in the streams, but as I only saw two they were apparently not plentiful enough to be of inconvenience to bathers. One I caught was bright green with a vermilion stripe along the side, and three inches in length.

I had a cold in the head and retired to bed early and had a dose of brandy, my first alcohol since entering the country. The bottle was kept rolled in my bedding, and no one in Hufuf but Mehdi knew I had any. It kept off the cold, which never became inconvenient.

[*December 22.*] The morning felt chilly, but was bright and sunny. As we had not seen the southern part of the town, we walked in that direction. My escort had not arrived at the appointed time, so Mehdi and I started without them after leaving word where I intended to go. They soon turned up at the run and much out of breath. We left by the Oqair Gate and held on outside the walls over a hard plain much used for rice-threshing.

The town at the south-eastern corner looked like a suburb that had been deserted before it was completed. Outside the walls there were streets and big houses in plenty, but no inhabitants to speak of. On the south there were a few gardens of palms coming close up to the walls, but the wells, twenty feet deep, do not flow, and water has to be raised from them by lifts. Their area is for that reason restricted, though the lifts have as many as five donkeys. Outside the palms there was the largest wheat-field I had seen, even then only three acres in extent. A party of twenty boys were going in a row across the wheat, pulling up the yellow-flowered charlock, and making a homely scene. The young corn was dark green and looked very healthy.

We returned by the gate in the south wall. It opens on to a large camping-ground 150 yards square, a feature of all desert towns, where large caravans of camels can enter and shelter just inside the walls. A fairly straight road leads from the other side of the square northwards and is well provided on both sides with shops. First came the shoe- and sandal-makers, the road being strewn with strips of leather cut off and thrown away, no one troubling to clear them up. There was also a sword-repairing shop and several corn merchants and coppersmiths and camel- and donkey-saddle makers. Half a mile from the South Gate the road enters the southern end of the big space of the larger bazaar, the Suq al Khamis, at the south-east corner of the Kut wall.

[*December 23.*] I took another walk through the bazaar. Carrots of the coarse variety also grown in Iraq were on sale, and there were baskets of an attractive round red radish. Most picturesque were the piles of large, yellow, gnarled and nobbly citrons. One of the most ingenious local manufactures are the donkey-panniers, woven out of palm fibre with the cunning of a bird's nest. They are in universal use for carrying blocks of stone and earth.

A rumour was afloat that the Sultan was coming here from

Riyadh. Mehdi picked it up in the bazaar. I was feeling seedy again, and was afraid my cold had been renewed. Despite having forgotten to bring a clinical thermometer, I managed to take my own temperature; one of the glass thermometers of the Royal Geographical Society answered well enough, and I read it with a mirror without removing it from my mouth. As it only showed 98° there was nothing to fear from fever.

[*December 24.*] The long-promised expedition to Qusaibi's garden took place, when I felt much more like having a long sleep at home. All the same, I had to confess on my return that I felt much better, although not quite well.

Muhammad Hasan, who had all the plans in hand, brought horses an hour after sunrise, and we rode over slowly. As it was called a shooting picnic I took a gun, but did not expect to use it, and later in the afternoon went out and shot a Kingfisher only in order not to disappoint my hosts. Abdulla Qusaibi was there and needed little encouragement to embark on his recollections of London. The Savoy Hotel had impressed him more than the Carlton, chiefly on account of the dancing. The London policeman took first place among all the marvels he had seen. He jumped into the middle of the room and gave an exhibition, holding up his hand and gazing intently and fiercely at the opposite wall as an imaginary string of motor-buses bore down on him and pulled up till he majestically waved them on. "And you will hardly believe me," he said to the audience, "but the policeman never shouts, he never even speaks!" Next to the policeman came the London fog. He had apparently been favoured with some good examples. He was more impressed with the performance of two retrievers at a pheasant shoot he had attended while in England than with the skill of the guns, more especially when the dogs brought birds from a lake that was frozen over. He thought it a pity to keep game for a week before it was

eaten, when it was so much better the day it was killed. I did not mention that it was often kept a month. He also spoke a great deal of the Arabic books of all ages at the Cambridge Library, and said that the copies of the Quran there ran into thousands and that Professor Browne knew more about Arabic literature than any Arab. And a bunch of grapes gathered from a greenhouse by a "bint" (girl, presumably his hostess) in mid-winter was still a vivid recollection.

There were several fields of tall reeds next to the rice-fields, and after the big meal I went through them, but without seeing a single bird of any kind. There were the runs and holes of some small animal along the banks, of two different sizes, and as it was not certain what they were I decided to come out at some future time and stay the night and trap. Some while after we were able to do this, and found the small holes were those of common Mice and the large those of Black Rats, neither of which were worth the trouble we had taken. The most interesting capture was a Giant Water Boatman (*Hydrocyrius columbiæ*) encountered in the bath-house—not a very inviting companion of the bath, but more harmless than he looks. He had ninety eggs sticking up on his back like ninepins, attached at the foot by silk, each one with a pair of little black eyes. The female lays the eggs forcibly on his back, and he thenceforth has no option but to shoulder all the family responsibilities. A more complete example of female emancipation has never come to my notice. His family made him slow of movement, and Muhammad Hasan landed him into a tin with a pair of fire-tongs.

Qusaibi told me wheat grew best on land outside the palms. The owners have two patches, only growing it in alternate years, leaving one fallow to recover its strength, as otherwise the soil gets tired. In very sunny countries it is wonderful how sunshine repairs the land in one year without artificial manuring. Independent springs rise all round here, some only big enough to irrigate one garden.

The Khadud waters flow there also and supply a large proportion of this fine garden area.

The timber used in Qusaibi's garden house is entirely sawn date-logs; even his entrance gate is a solid affair of date timber. Most of the gates and doors hereabouts are made of rough ill-fitting planks sawn from mulberry and Ithel trees with big stems.

On Christmas Day there was a north wind, higher than usual, and bright sunshine.

Most women in Hufuf walked about with a bunch of sheep's wool and a spindle like a peg-top, spinning as they went. Rope was made out of palm fibre by men, who sat in sunny corners of the street, twiddling with horny hands the fibre, which gradually extended from them out into the street in the form of rope. It was a coarse production, but we found in travelling that it stood the chafing of camel transport much better than the hemp rope I had brought. A fish merchant was vending several baskets of dried fish, obviously from Bahrain: one kind was the size of large whitebait, and there were dried prawns and some spiny-backed fish like large mackerel. The absence of coffee-shops was most noticeable in Hufuf. In reality there were three, although one small tent in the big bazaar was the only one I saw. I asked Rustam, a servant, if he could tell me why they were not more plentiful, and he said it was the custom of Hufuf people to take coffee in each other's houses and not in public; only a few badawin who knew no one went to the coffee-shops, and they only sold black coffee, *i. e.* you could not get tea there. On the other hand, in Bahrain even the big Shaikhs are seen in the public coffee-shops. It is probable that this is a result of the tyranny of the old Wahhabi regime, when it suited the people best to be as inconspicuous as possible, and the order against tobacco smoking may have something to do with it.

I paid a visit to the Governor, which was really a Christmas visit, though I did not mention the fact. I

think he expected to be attacked on the question of my delayed departure, but I kept business topics in the background, coming no closer to them than when I asked if there had been any rain, and he hastily replied, "None at all in the South." He was much interested in the size of shot used in my cartridges. He wanted some large shot for Gazelle and sent for some of his own twelve-bore cartridges to get my opinion. They were all No. 5½, of English manufacture, obtained through a Bombay agent, and he did not know how to order. I recommended No. 1, and told him that they would have to be specially loaded to order, and that I would send some out on my return to London. All this was for his sons, as he himself never went out hunting, being a slave to his official duties.

In the evening I went to call on Muhammad Effendi, no mention of the Christian festival, however, passing between us. The topics of conversation were varied, and it taxed my powers to answer some of his questions, which ranged from agriculture in foreign countries to aeroplanes, airships, the Japanese earthquake, and the climate of the North Pole.

December 26 being Boxing Day, it was made the occasion of distributing the first largesse to the servants. It was explained to each one that this was an annual festival in England, when presents were distributed, stress being laid on the annual nature of the function. Muhammad Hasan topped the list: not only did he deserve extra for his more genial service, but he had not been rewarded for his journey to Salwa with me in 1921, so I gave him £5. The head servant, who was also coffee-bearer, got £2, and the general factotum £2; the two men who brought my meals across Hufuf from the Effendi's kitchen £1 10s. each, the water-carrier 7s. 6d., and Abu Saud, the other soldier, £1 10s. I had reserved £3 for Said, intending to send for him, but the news reached him before I had finished the other servants, and he asked if he might come and salam me, thereby saving me the trouble. He

said he had been called from my service by being put in charge of the kitchen supplying the Arab guests of the Governor. I should imagine the poor guests had to pay dearly for Government hospitality during their stay. I laughingly said I thanked Allah that he had come to life again, for I had been most anxious since I had not seen him, and feared the hard work I had given him had killed him. He carefully counted the money to see how much it was before pouching it; not one of the others had the bad manners to do this.

Rustam told me that Riyadh had practically no bazaar or industries. The inhabitants brought their wares from Damascus or Hufuf, and they were all either garden-owners or the fellahin who work for them.

The weather was colder, and another Hufuf product disclosed itself, the warm boots worn by badawin and villagers. They are called *zarabil* and cost three rupees a pair. They are socks of knitted camel-wool coming well above the ankle and tied, the foot being enclosed in a shoe of locally tanned cowhide. The warm-weather shoe is the ordinary sandal (*nala*), also made locally. I was glad to be wearing winter wool underclothes with thin shirt and a thin Norfolk jacket, although I had thick flannel shirts and a thick Norfolk jacket in reserve in case it got colder. (I never used them during my stay.)

[*December 27.*] The big mosque and minaret were not used for prayer, as they were too decorative for the simple tastes of orthodox Wahhabis. The minaret was chiefly used by the falconers, who lost a falcon every few days and would dash up to the top to get a good view of the surrounding country.

Hasan told me there were no Jews in Hufuf, as Shaikh Abdulla had them all sent out of the country when he became Governor twelve years ago.

On this date I had the first case of the virulent fever that attacks the natives here. One of the servants, after looking very seedy, collapsed. I gave him a dose of

quinine and phenacetin, but he became rapidly worse and was eventually carried to his home, where he lay near death's door for about a fortnight. He was a sorry wreck when he returned. The symptoms seemed those of an advanced stage of malaria, since he said it came on him at intervals. His brother, Rustam, said that he caught this fever through hitting a cat a few days ago with a stick; as cats are full of fever it ran up the stick and infected him.

[*December 28.*] A cold fog hanging over the town at sunrise dispersed in an hour. A south wind revived my hopes of rain, as the south-west seems the most favourable quarter. Rain-clouds could be seen from any direction getting higher and thinner as they approached Hufuf, and they passed over without shedding a drop.

One of the pastimes of the people is keeping tame pigeons. They are mostly of the old carrier type, with big wattles round the eye, but like all domestic pets here they are scarce. A few rabbits are kept, a relic of the Turkish occupation. Chickens are large, and eggs are as big as English eggs; the little hen's egg of India would find no favour here. The tanning of sheep, camel, and cattle hides is done locally by steeping them in a tank with pomegranate skins, dates, and dung.

I shot a Jackal, thinking it well to take one specimen in case they were peculiar. It was hit in the lungs and went through some most extraordinary antics, leaping high in the air in all directions like one possessed. The soldiers shouted with laughter, more especially when another Jackal, which had been beside it and had run away at the shot, returned and seemed so fascinated by its capers that it imitated them in a way too ludicrous for words, finally rolling beside the body in the lucerne until we thought it safe to approach, when the second animal jumped up and made off. We had to put the carcase high up in a date tree out of reach of the other Jackals, and Mehdi brought a knife early next morning and skinned it. After it was

dressed and temporarily stuffed out with hay he put it out in the street, where it looked as if it was asleep, and the men amused themselves watching the passers-by making a wide circle to get round it.

I bought a nice badawin dagger that was for sale in the bazaar for eight riyals ten tawila, a little less than a pound. It was in worn condition, but it was silver-mounted and of South-country design, that is, from Wadi Dawasir or Najran. There were two of the wildest-looking badawin in the bazaar, with long black locks and beards and ferrety black eyes. They spoke to Hasan, and I asked who they were. He looked embarrassed and said, "From Wadi Dawasir." It was not till afterwards that I found that this was a politic lie and that they were really Awamir from a branch of the Oman Awamir who live to the south of Qatar and are more tractable than their more southerly relatives, as they have occasionally to come and ask favours of the Governor. In years such as this, when their own deserts will not support them owing to drought, they have to ask permission to come north into the Sultan of Najd's territories, which they are allowed to do for a consideration. If they did not behave themselves, the permission might be withdrawn, and the Government is strong enough to enforce its decrees.

[*December 30.*] Clouds all gone, reappearing in the evening towards sunset. The sun went down in a glorious blaze of gold and red, lighting up range after range of hills to our northward with its last rays, and turning them to gold. I thought Jabal Abu Ghanima was an isolated range, but there are several parallel ranges running eastward and westward to our north-west. I received a letter by Haifa-Baghdad air mail, and a *Times* dated November 22, via Bombay.

[*December 31.*] I was beginning to realise that my long stay in Hufuf was going to prove a blessing in disguise and that my hasty judgment as to the absence of interesting forms was premature. The plums for the naturalist were

undoubtedly here, but it required time and patience to secure them. To-day we caught a specimen of a species of Jird entirely different from those infesting the lucerne gardens. The holes were noticed in the sandstone plain north of the town in the direction of Mubarraz. Traps baited with coco-nut set over-night contained these creatures in the morning; they are entirely nocturnal feeders, and also differ from the others in having longer coats.

An expedition was arranged to Jabal Abu Ghanima (Plate 29) and the well of sulphurous water lying at its base in the desert, Ain al Najm. It is mentioned by Palgrave as being supposed, in his day, as it still is, to cure most complaints, and had aroused the suspicion of the Wahhabi ruler, Faisal ibn Saud, who, fearing the people would put their trust in the waters instead of in Allah, had it filled up. The bath-house is now an almost ruined building, although there are no restrictions on its use (Plate 22). It has two rooms fitted as vestibules and leading down to the water, also covered in. It is tapped on the outside by a channel taking water to a water-lift. Someone was trying to clean it out to start a patch of wheat cultivation, and two men were stirring up a black fetid mud in the bath itself. I had been told that the water was hot and that a chicken could be boiled in it, but it was only tepid, so I did not take the temperature; it looked as though it were drying up.

On the roof I heard the whimper of the Desert Lark and saw, sitting on one of the domes, the pale bird that I had been looking for. In the hills I got two more, one being of another species, a smaller, darker bird that has been identified as *Alauda cinctura pallida* from Qanfida in Asir. The bigger one is new and has been named *A. deserti azizi*, in honour of the Sultan Abdul Aziz ibn Saud. The sandstone of the cliffs was cut out into caves and crannies, in the mouths of which were the pellets of an Eagle-Owl. I could not imagine what species could inhabit these

desolate ranges, and we could not find the bird. On some of the overhanging cliffs were nests of the Crag Martin, saucer-shaped cups of mud stuck on the side, where the birds came in the evening to sleep. As it was winter they were not then breeding, but their nests gave the proof I wanted that these birds were residents and not winter visitors. On the way home I found myself hoping that our departure for Jabrin would be delayed until the Eagle-Owl had been obtained.

We passed some depressions lying towards Mubarraz, where natives were able to scratch the ground and find sufficient water to irrigate a few square rods of scanty wheat. The lift is worked by hand, a leather boat-shaped scoop being dipped in the well and raised to the trough, the weight counterbalanced by a wood block poised on a long pole. The small crop of wheat could hardly be sufficient to repay them for the hard daily toil. As usual we walked the horses all the way out and on the return journey. Muhammad Hasan, who was by now convinced I could not ride, went off for one of the show-off gallops across the plain by himself; I thought no more about him till I heard Mehdi muttering, "That will do him a lot of good." On looking round I saw Muhammad's white mare standing on her head in the sand, and a yard in front was Muhammad, also standing on his head. The first to recover was the mare, which got up and galloped for the date-gardens leading to Hufuf as fast as she could lay legs to the ground. Muhammad picked up his loose property lying round and hobbled after her. Mehdi was quite unsympathetic, having doubtless been nettled at the aspersions thrown on his master's horsemanship. "Now we shall hear no more of that," he chuckled. Beyond being bandaged on the instep and limping for a few days, Muhammad Hasan was not hurt, and the mare was none the worse.

[*January 1.*] I bought another dagger with coloured stones mounted in silver for six riyals, and a silver-mounted

badawin sword for twenty riyals. There are two shapes of sword in use, one curved and one straight. When I asked Muhammad Hasan what the difference was, he saw his chance, and said with a merry twinkle, "One is male and one female." He gets such a dose of the differences of sexes in birds and mammals during our outings.

[*January 2.*] Reeds and rushes are cut and stacked in bundles to dry and are then woven by women into lengths of neat matting of a fine mesh. The stems are not split, and I found them very useful as pipe-cleaners. This matting is used to cover the floor in most houses and is very durable.

I bought yet another dagger, a silver court dagger from the court of the Amir of Hail, Ibn Rashid, recently captured by the Sultan's forces. It had a plain silver scabbard with three turquoises, and was smaller and straighter than the shapes from the South.

The last palms to the west of the oasis are but a mile west of Hufuf town, and are continuous with the palms watered by the Khorasan spring north of the town. Mubarraz town is isolated in the plain, but has palm-gardens to the south, and to the north Ain al Harra rises and flows eastward and a little northward, when the water after three or four miles is quite exhausted. Further north, but isolated, come the gardens drinking from Umm al Saba, and further still to the north, and also isolated, are the palm-groves of Ayun that are only just visible from the top of Jabal Abu Ghanima.

I cut my hair to-day with the help of a pair of nail-scissors and a looking-glass, and was surprised to find how easy it was. It looked quite as well as many hair-cuts for which I have paid a shilling.

[*January 3.*] I learnt the name of another hill, just north of Jabal Qara and a conspicuous range. It is marked on some maps and missing on others, and is called Kalabiya, pronounced Chelabiya.

[*January 4.*] Truly the mammal-collector is beset with

difficulties. We had very bad luck with the traps: four out of the six caught the smaller Jird, and they were all robbed by Jackals, the traps being dragged off and lost.

The quiet and the industry of the town never ceased to evoke my admiration. Probably the revenue demands were light and not too harshly administered, and the machinery not complicated or tiresome to the Eastern mind. Again, all judgments were vested in Shaikh Abdulla; he was the Petty Sessions and Justice of Appeal. His rulings were just, the sentence followed the hearing, and the execution of the sentence followed that with summary swiftness. The town itself was out of sympathy with the Wahhabi and Ikhwan doctrines, and Ikhwan was secretly a term of derision even among the majority of the Governor's soldiers, while he, although openly upholding the Ikhwan, did not try to coerce his people into accepting their tenets. His eyes gleamed when I told him Jackals had robbed my traps. Here were thieves up against his very town-walls over whom his jurisdiction had no power.

[*January 5.*] I bought two saddle-bags of Hasa make, of woven sheep's wool and camel's hair. They were donkey-size; one cost ten rupees (13s. 4d.) and the other six rupees. They are made by the village women. I was able to buy some English weekly illustrated papers dated August, 1921, for eightpence each. Although they were so much out of date, their value was well maintained in this out-of-the-way spot. I found they were imported for the purpose of wrapping up parcels.

[*January 6.*] After a succession of bright warm days the temperature fell slightly. I rode to the spring called Umm al Saba, about seven miles northward. I had determined to have a long day's hunting, whereas the soldiers were looking for a long revel of coffee-drinking and feeding, and they won. Immediately after the first breakfast the usual midday meal arrived, but we got away about an hour after sunrise and went straight through Mubarraz, a walled town with big spaces inside both the

South and the North gates by which we entered and left. There is also an insignificant bazaar of about a dozen shops; the streets are narrow and completely blocked by the wide-loaded donkeys. The houses have wells of still water. Half a mile beyond the North Gate lies the pool of Ain al Harra. There were thirty women bathing in the tepid pool at the far end, and all were unveiled. The palm-belt dependent on this water can be seen running east and ending in the desert two miles from the well.

The road ran nearly north across a bare sandstone plain, with a small Government fort two and a half miles from Mubarraz. At six miles from Hufuf we entered the palm-belt of Ain Umm al Saba and soon reached the basin. There is a black hole in the middle up which the water rushes and quickly flows out in seven different streams, each of good size. I found the temperature at the edge to be 101° F., and the temperature of air was about 60°, so it probably lost two or three degrees in reaching me. When the summer sun is on it the air temperature would be at least 120°, and the water must be raised to 110° when flowing down the streams. I went specially to see if there were any fish and found some at the outlet from the pool, keeping up against the swift water with ease and apparently enjoying a temperature that would be considered hot in a bath, but the coolest temperature they have ever known. It would be interesting to know whether Nature has provided them with any adaptation to withstand these abnormal conditions. The wells are fashionable for the bathing picnics of the well-to-do Hufuf people, who come out in big parties on little donkeys hired out at a riyal a day. We had coffee with two separate groups and a square meal with a third, and I then dragged my reluctant soldiers away from the hospitable atmosphere.

We travelled northward through the palms until we issued at their northern extremity, in order to ascertain their limit. They faded into desert about three miles north-east of the well. We returned splashing through a large,

shallow, spill-water lake and reed-beds for two miles, and moved not a bird. It was as lifeless as the waterless desert. We were just passing through the last patch of rush when up jumped a cock Francolin, or Black Partridge, and it settled in the dense reeds. My gun was in my saddle-bag, and in spite of half an hour's search for the bird it could not be found again and had to be given up. The men called it a *Warara*, not the Iraq name, *Daraj*, or, more general, *Hajar*. They also said they hardly ever saw them. I steered the party wide of the picnic parties at the spring, but they defeated me at Mubarraz, as the local Amir had been warned in the morning to have coffee ready for us. He was partly negro, the regular official, Muhammad ibn Thanian, being away. We sat in the open space opposite the Government buildings, and, as soon as we had dismounted, our horses lay down curled up in the sand close to us and went to sleep. My mount was a flea-bitten grey, sent as a present to the Sultan from King Husain, Sharif of Mecca. After ginger tea, coffee, and the ritual of the incense brazier, we departed.

[*January 7.*] It looked as if the Sultan was going to spend more time in Hufuf. Next door but one to the guest-house was his immense new Palace (Plate 19), and all day long donkey-boys were unloading blocks of stone for the rebuilding of the intermediate space. The Sultan's private apartments almost touched my house at the back, and the windows overlooked each other.

[*January 8.*] I took a photograph of one of the Governor's Salukis that came with a slave. It was named Dhabī (gazelle), a creamy white bitch. The coat is smooth but silky and thick, the smooth tail is carried low, and there is no feathering on legs or ears. (Plate 44.)

I heard that Shaikh Abdulla had eight sons living in Hufuf, two of whom were married and had houses of their own. We intended to walk out to the Qusaibi's garden and I had steadfastly resisted all appeals to take horses,

but the appearance of three donkey-boys on the road was too much for the soldiers, and they tried to "borrow" them, saying the Sahib wanted to ride. Luckily the owners were not overawed, but beat the mounts into a gallop and refused to stop, soldiers of the Shaikh or no. It was an amusing spectacle to see the soldiers with flowing robes and swinging swords running after them, and it was marvellous how the boys, balanced side-saddle fashion, garments flying in the wind, kept their seats as they out-distanced their pursuers, who were anything but athletes. There was a very reddish Jird out in the eastern gardens, and I thought I was on the track of another species. It eventually proved to be a different subspecies.

The Qusaibi gardener had a plate of winter Rotab dates picked from the tree, and considered a great luxury because they were out of season. They are grown on very young trees and are uncommon, and have to be protected from the attentions of birds by being wrapped in matting, while sometimes a plate of fruit is placed beside them to divert the birds' attention. The gardener also said that Arabs do not kill rats, as they remember their enemies, and the sorrowing relatives come the following date-season and nibble the stems of the great date-branches in revenge. This was told me quite seriously, but as the rats do this in any case, it is difficult to know where the ordinary damage ends and the revenge begins.

[*January 9.*] Muhammad Hasan had a story that a big Owl had been seen on Jabal Abu Ghanima by a man who said it came to a certain rock every evening and hooted at sunset. He also repeated a conversation he had with the Governor, when Shaikh Abdulla said how sorry he was that there had been no rain and that he had been compelled to delay our expedition to the South. It was evident they were anxious to do their utmost to assist my enterprise, which was of a very unusual kind. Had the condition of the country been known, I should have come about January or February to undertake slow cross-

country journeys, as from February to June there is a certain amount of growth on the bushes even in times of drought, but in my ignorance I arrived for the three barest months of the year, and that year had been exceptionally dry.

[*January 10.*] Another foggy morning, cold and clammy. News arrived that the Sultan would be here in a few days with 300 men in his retinue and his family. As all his sons, even the small boys, had their own establishments and separate houses it meant that the billeting was no small undertaking, and a dickens of a rout was going on in Shaikh Abdulla's camp. My soldiers had to take their part in the general rushing to and fro, and Muhammad Effendi was down in the bazaar buying some new earthenware water-filters. Rustam told me that the Sultan often stayed in Hufuf four months at this time of year. Saud ibn Abdul Aziz ibn Saud, his eldest son, was left in charge at Riyadh during his father's absence.

[*January 11.*] The architect, Muhammad ibn Ahmad, who was doing so much building for the Sultan and the Qusaibi family, was born in Hufuf and was apprenticed in Persia at Bushire, and afterwards worked at Kuwait. He had now taken service with the Sultan as Government architect. He is a one-eyed man with a foot much mutilated about the toes, probably by a falling balk of timber. He said he drew his plans first on paper. Big timber has to be bought from India, as well as rafters, which are round straight tree-trunks about three inches in diameter. He had also used date-palm beams, but they did not give so wide a span for a room as the others. The masonry is mostly Hasa chalky sandstone blocks, and "juss" or mortar plaster. Cement is imported and used for special places, and always where water touches the structure. The interior wall-surfaces are plaster smoothed down and ornamented with crude designs such as squares and circles cut out with a knife. The lower windows are glazed and generally barred outside with iron; above

them are ventilators made by square open-work bricks. He said he did not build more than two stories because of the trouble of going up the steps. His rounded arches are very fine, and the studded timber doors with his white masonry designs above and around them are works of art. The style is more that of the Persian Gulf littoral than of the interior of North Persia (Plate 15). In the case of the new Palace the Sultan apparently had much to say about the plans, for the design is Arab (Plate 19). The pointed arch which the Sultan called the "ibrahimi" was mentioned and admired by Palgrave in 1862. J. B. Mackie (*Geographical Journal*, March, 1924) says the beautiful mosque (Plate 14) is the work of Ibrahim Pasha, one of the Turkish Governors some 150 years ago, and the old style of arch is doubtless of the same period. They are formed by two date-logs on pillars, inclined towards each other to meet in the middle to form the roof. The new style of keyed and rounded arch will therefore create a period in the architecture of the town associated with the reign of Abdul Aziz, the present Sultan.

The Wren Warblers were beginning to come into full song, which made one think the winter was over before it had begun. It is not much of a song, but there is so much variation that it seems as if another bird has appeared on the scene. There is one bar that sounds as if the little songster is exploding, another is like the chink-chink of the chaffinch, and yet another resembles the winding of a watch. In skinning one of these small specimens I nearly cut the top off my thumb, but it healed without any trouble, as it was immediately cauterised with permanganate of potash crystals moistened with saliva, care being taken to keep the crystals themselves from getting in the wound. This seems an infallible remedy if the skin is broken, and ensures a rapid and clean healing, which is often so difficult in hot climates. It is more effective if the strong solution of permanganate is smeared on before the wound is bathed, as water itself often contains germs and causes suppuration.

[*January 12.*] According to Muhammad Hasan camels are not worked till they are five years old. The first year they are called Hawar; the second, Mafrud, when they are weaned (*mafrud* = weaned); the third, Hedj; the fourth, Leji; the fifth, Theni. They then work and breed and have a full mouth of teeth. The first teeth are *Ruba*, which are shed; the second lot of teeth are called *Sedus*.

We rode out on horses to Ain al Najm to get more Desert Larks and, if possible, find the Eagle-Owl on Jabal Abu Ghanima. The cleaning operations at the well were not progressing, as the side of the lift had fallen in, and the water smelt worse than ever, whether from sulphur or the remains of soapsuds, I was not sure. The water was too bad for our soldiers to touch it, but a small party of badawin were resting there and drank it and seemed to be enjoying it. It is marvellous what these people will drink. Two of the well-cleaners had some local-made traps that they use for catching the Desert Larks they call *Hamra* and Wheatears. The trap is a very good imitation of a break-back trap, though of course the idea is much older. Two half-circles of wood are made to snap together with a force that is incredible by means of a spring made of twisted sheep's wool. The bird releases the catch by pulling at a string to which the bait is attached. The bait is a white beetle-grub called *Sirru* that is found in the sands. *Sirru* is also applied to any maggot or caterpillar.

On arriving at the crags of the hill I sent the two soldiers and horses to a shady cliff and examined each kopje with care. The range runs for a mile or two westward, and I only got a Red-tailed Wheatear (*Enanthe chrysopygia*), which I was glad to secure, as I had found it nesting 10,000 feet up the Elburz Mountains, north of Teheran, and now knew its winter quarters. As I was returning to the last hill before rejoining the horses, a Fox appeared from the other side and ran across in full view, followed by two of the palest Eagle-Owls I had ever seen. It was as well they were too far off for a shot, because Muhammad's head

appeared on the skyline a moment after. He had seen the Fox and was giving chase with his rifle. It was extremely annoying, as he had thoroughly disturbed the hill and might easily have sent a bullet in my direction. We waited at sunset for the Owl to return to its favourite rock, but it did not, nor was it likely to do so after such a commotion.

There was no time to take bearings, but the view from the top of Jabal Abu Ghanima is a wonderful panorama, and this would make a good station for anyone who wished to survey the oasis. Northward the palms of Ayun are seen lying below a hill range. Southward Jabal Arba stands out of the plain like a huge castle. On the southern horizon is another range, Jabal Kharma Zarnuqa. The road to Riyadh can be traced across the plain towards Jabal Ghawar, a range visible on the western horizon, while the dark green patch of palms runs from Hufuf eastward to the foot of Jabal Qara. The next time we got to the hill-top I was tempted to take a few bearings, although I did not wish to appear interested in the geography of Hufuf. On this occasion a hill far beyond Ayun to the north caught the sun and reared itself like a straight-walled fortress from the plain. The men called it Graimiya. It was possible to trace the outline of the palm-gardens from Ain al Harra, running eastward and then southward in an unbroken line to meet the palm-belts of the Khadud and Haqal springs, and thence to Qara Hill. To my north and north-west, my horizon was a series of ranges running parallel and eastward and westward. From these observations I was able to make a rough sketch map of the oasis on my return to England. Had I realised that this was all entirely unmapped, I should have taken the risk of making a more systematic survey.

[*January 13.*] Clouds that in any other country would bring rain covered the sky. I had run out of engine-oil for gun-cleaning. I had brought only about three egg-cupfuls, and ought to have had a reserve, as it could not be bought in Hufuf. The local oil is mostly animal fat

and rusts the barrels. It is fatal to have any grease on a gun in desert travel, as it is quickly coated with fine sand in the joints. Guns must be wiped quite dry after cleaning, and even then they pick up more sand than is good for them. Letters arrived from London, dated December 7 and 12, both by air-mail via Baghdad, with a note from Daly, dated Bahrain, January 8.

A man on a camel brought water-skins to be filled in Hufuf and taken out to the Sultan's camp, so we knew him to be really on the road.

[*January 14.*] Warmer weather seemed to indicate that the winter was over. Several thunderclaps came from the clouds, and rain might have fallen in the distance, but we had none. We rode out to try once more for the Eagle-Owls. The horses were brought into the courtyard, and during the saddling process an Arab stallion kicked Muhammad Hasan on the arm. There were no bones broken, but it was swollen and I dressed it with iodine. Muhammad Hasan was to ride an English remount, a waler. It was a horse with a history that began at Bahrain. Shaikh Isa's family had apparently bought it at a remount sale after the war, and had found it a handful. When Faisal and the Najd Mission passed Bahrain on their return from London, an exchange of presents was necessary, and the Khalifa family saw an opportunity of doing the correct thing and getting rid of an embarrassment at the same time. The animal was therefore presented and was landed at Oqair. The groom deputed to ride it to Hufuf got to the oasis, but during one of the show-off gallops, its long hoofs brought it down with him, breaking his nose, and he had to go to the American doctor at Bahrain to get it mended.

This was the mount that was now in the yard, and I could see there was trouble ahead, as they approached with an Arab bit, and he reared every time it came near his head. The Arab bit is one of the fiercest of all, and in inexperienced hands can be very cruel. The ring

round the tongue and lower jaw is levered on to a curb-rein that can stop the horse dead. The Arab usually rides on a wool rope fastened to a head-collar, and does not guide the horse by its mouth, but merely by moving his hands over the mane from left to right, and the bit-rein is only touched on occasions. The remount had no doubt tested this bit and refused to have it anywhere near it. So after some delay, Muhammad Hasan started with only a head-collar, and had got no more than half a mile outside the town when it became clear that his horse was too much for him and that he had insufficient control. I suggested an English snaffle-bit, but he said there was not such a thing in the town. Sitting on the horse, he got one of the soldiers to try to put the Arab bit on again. Up went the horse, stood for a moment erect with Muhammad clinging to the saddle, then fell over backwards on top of him. There was a resounding whack on the hard ground, and I was relieved when I saw him get up almost as soon as the horse. He was not hurt, but decided to lead the horse back and change it. However, he did not rejoin us, and made an excuse that he could not get another, albeit it was more probable he had had as much equestrian exercise as he wanted for one day.

We went on to the hill, and leaving the horses and men with instructions to wait till they were called, I took Mehdi and searched the nooks and crannies from a distance with field-glasses. In one of the holes an Eagle-Owl was sitting at the entrance with ear-tufts erect, looking so like a piece of rock that it would have been indistinguishable with the naked eye. Leaving Mehdi to watch in case it bolted, I did a long detour to make use of some dead ground, and then gained the foot of the hill and commenced an ascent up a steep and slippery face of loose shale and rubble, where the greatest care was necessary to avoid dislodging any stones to go clattering down the incline. I had fixed the exact place by taking lines from prominent rocks, and I arrived within shot of the entrance. There was no

sign of the Owl. Keeping a rather unsteady balance, I threw a small stone and was suddenly confronted with a pale fawn head and a beautiful pair of golden eyes. For a moment we stared at each other, as the sun was behind me and the bird was dazzled. The next moment it was sweeping with noiseless wings across the valley. Had it remained, its beauty would have triumphed and I should have had to let it go, even after the long and tedious stalk ; but when I saw it rapidly getting out of shot, the hunting instinct came uppermost once more, and it fell 100 feet below me, just as the loose shale gave way under my feet and gave me a toboggan slide almost to the spot before I could stop. Mehdi had already covered the distance from his point of vantage and was calling out : " This is new. We've never seen the like of this before." It was indeed a beautiful bird, with all the most delicate shades of fawn and sandy yellows in the colour scheme described as desert colouring. This was my first view of the Desert Eagle-Owl (*Bubo desertorum*). The Eagle-Owl of Iraq is a much darker bird with rich brown vermiculations and stripes that are very wonderful, but are nothing to the soft harmonious cream-coloured beauty of the bird that lives in Hasa. On my return to England I searched in vain to match my skins among specimens of Desert Eagle-Owls from Palestine and North Africa, but it was not till they were compared with three skins from Aïr, collected by Captain Angus Buchanan in the Western Sahara and now at Tring Museum, that an exact parallel in shades of desert colouring was found.

The other Owl, the female, was much more cunning. She led me to the top of the hill, and then flew out into the bare desert where a hidden stalk was impossible. After a long crawl in the hot sand I would see her take flight before I got within shot, and settle about 500 yards further on. If she settled out of sight, she would squat flat on the ground, and was quite invisible among rubble or small bushes. We then had to form a line with horses, and beat

a large stretch of country, and on these occasions she would lie closer, yet I was always at the far end of the line when she rose. At last Abu Saud suggested he should ride and turn her in my direction. It seemed as unlikely to succeed as any other strategem, but it provided us with a little amusement. So desperate did he become that he tried to overtake the Owl in flight, and such was the speed of his little mount that in a fair match between Owl and horse he did overtake it, much to my surprise, but turned it in the wrong direction. We gave up the chase only when it was too dark to see. Although I had had only one long shot at the Owl, fortune proved to have been with me when we went again to look for it five days later. After an unsuccessful survey of the hill with glasses, Muhammad Hasan said he could see something in the distance that was either the Owl or a bit of an old shirt. On going to the place we found the Owl lying dead. I expected to find it decomposed beyond recovery, but instead it was quite fresh, the cool weather having preserved it. Why neither foxes nor ravens had destroyed it will ever remain a mystery, and I marvel still more at its chance discovery, when it might so easily have fallen in a place where no man could have found it, a waste of life and a great loss to the collection.

CHAPTER XII

IN HUFUF WITH THE SULTAN

[*January 15.*] A sharp thunderstorm during the night brought heavy rain for a short time from the North. The dust was well laid at last, but the thirsty streets did not run with water. It was, however, considered a good rain locally, and heavier than had fallen for two years. The wind this morning blew from all points of the compass and was gusty but not strong. I had not so far experienced a wind of more than twenty miles an hour in Hufuf. Sleep entirely left me last night, owing partly to the thunder and partly to the excitement of getting the Owl. I tried a tablet of phenacetin, but it had no effect, and I then drank a peg of brandy, which sent me off. It was only my second drink of alcohol. I cannot say I felt any the worse for being a virtual teetotaler.

The Sultan, with 350 camels and his court and soldiers, arrived two hours before sunset. They entered by another gate, so I did not see the procession, but I expected to hear they were in, as a mounted man went by the house at full gallop from sheer excitement, scattering wayfarers in all directions. The servants said that his son Faisal was with him, and the Sultan with characteristic energy held receptions to a late hour, as everyone wished to be the first to greet him; his chamberlains must have had hard work in arranging the precedence. Muhammad Hasan advised me to call the next day when the first rush was over.

[*January 16.*] Muhammad Hasan had a breathless morning arranging my formal visit. He first gave me an hour's warning in order that I might don my Arab clothes and be ready when the final summons arrived. Mehdi

was to be taken to be introduced at the same time. At last a message came, and I picked up Sir Percy Cox's letter and sallied forth, and went to the same room where I had so often been greeted by Shaikh Abdulla. Apparently the Sultan's new hall was not yet ready. The ceremony observed was much the same, only there were more people present and many strange faces at the back of the hall. The Sultan was sitting on the seat usually occupied by Shaikh Abdulla, whom I expected to see seated beside his Royal master. When I afterwards remarked on his absence to Muhammad Hasan, he was highly amused, and told me that Shaikh Abdulla had been present and not far from me; he was, in fact, sitting on the floor by one of the entrance doors. I then remembered noticing a figure in that lowly position, and had assumed it was a slave. "So it was," laughed Hasan, "it was the Governor of Hasa." This complete effacement of a luminary on the arrival of a bigger one is a remarkable feature of Arab society. He does not take second place, but drops out altogether. It seemed almost churlish not to recognise Shaikh Abdulla's existence, and after a week I suggested to Muhammad Hasan that I should like to pay him a complimentary call, as I heard he held small receptions in his own house during the Sultan's stay. He probably took my message to Shaikh Abdulla, though he did not admit it next morning when he told me that he did not think it necessary for me to pay my proposed visit, as I had the Sultan to go and see, and what more could one want? It so fell out that I never saw Shaikh Abdulla again, and as I had acquired a great regard for the bluff old autocrat, I was really sorry.

As I walked up the long room, I was wondering what ceremony was expected of me, but the Sultan's smile when he saw me and rose to greet me put me at my ease at once. He placed me on his left, and we were soon exchanging inquiries and personal news. He asked after Sir Percy Cox and told me of the great friendship he felt

for him. I gave him the letter, and he asked if it was the same as the one of which he had already received a copy. On being told that it was, the Sultan put it down beside him without reading it and remarked, "Sir Percy Cox said in his letter that he was sorry he could not come too; he is not more sorry than I am." He then asked if he was still in Government service, and I explained that he had retired and was busy settling down in a new house in London. The Sultan next congratulated me on my disguise as an Arab—and indeed, as my beard had now grown to a respectable length, I was feeling much more pride in my shaikhly appearance. Mehdi was then brought up the room and introduced. The Sultan leant forward in his chair, and Mehdi kissed him on the forehead and retired to a seat half-way down the room.

Ibn Saud talked hard while the first round of coffee was served by a very black negro, who handed it first to his master, who drank before anyone else. I had been wondering how to address him and dropped naturally into "Jenabuk" (your Highness). I found his Arabic easier to understand than that of Shaikh Abdulla, and he understood me better. He said rain had not fallen in Najd, but they had had plenty in Washm (to the northward). They had caught the outskirts of a thunderstorm two nights before on the way, though it had not been sufficient to make the road slippery for the camels. He spoke of the illness Dr. Abdulla Effendi had already mentioned to me, and said that it was fever in the eyes and face, of which Dr. Dame, the American Missionary doctor, who happened luckily to be in Riyadh, had made an effective cure. The doctor had continued his tour to Shaqra about the time when the Sultan left Riyadh. This affliction of the eyes was possibly the origin of the rumour which reached the outer world via Palestine, gaining rapidly in the course of its travels, until it arrived at the coast in the form of a false report of his decease, which was announced in the European papers with an outburst of libellous obituary notices as

inaccurate as the report itself. If the rumour did not have its origin in this way, it must have been the complete fabrication of some politician who stood to benefit, even if but temporarily, by his decease.

After inquiring how the air of Hufuf suited me, he expressed regret that my departure had been so long delayed, but said the postponement was unavoidable. I replied that everything in the town was delightful, that 140 skins of birds and animals had been collected and one box had already been despatched to Sir Percy Cox; but all that I could possibly do there had been done, and I was waiting to go on. Some time when his receptions were over (his first two days were given up almost entirely to receiving people) I should like to bring along some specimens to show him.

I also asked if I might pay my respects to his son Faisal, whom I had met in London. He replied: "He is here now. Would you like to see him?" and called "Taal, Faisal!" ("Come, Faisal"). From among the crowd of soldiers at the back of the hall, a tall, slim, handsome boy arose and advanced up the middle of the room. I had met him some five years before when, as a sedate and dignified child, he had headed the mission sent to London by his father. I had gone with him to the London Zoo and had recollections of him standing among the rocks of the sea-lion house, while the animals were being fed, a stately little figure with flowing robes, gold sword and gold *aqal*. The keeper deftly threw fish into the water and on the far side of the pool, and then, unnoticed by anyone but the biggest sea-lion, quietly dropped one at the feet of the little prince. In a moment a large face emerged from the water, followed by a dripping body which lolloped straight for the fish and the prince. For a moment the boy stood firm, then his courage deserted him and he picked up his skirts and fled for his life. Another day we went to the Natural History Museum, South Kensington, where he was particularly attracted by the large gorilla. On being

asked why, he said its face reminded him of one of his negro slaves. This was the boy, now grown almost out of recognition, who advanced down the room. I went to meet him, and we shook hands in the centre. Although his carriage and bearing were now those of a man, his features retained the delicate beauty that he had as a child. As he seemed inclined to return to his corner after the greeting, I rejoined the Sultan. It would not have been considered decorous for the son to detain a guest in his father's presence.

All the time I was there a continual string of Arabs were being brought in by aides-de-camp from among the soldiers, who introduced them by name to the Sultan. They kissed his forehead, but he hardly noticed them, and not a word was said, unless it was a muttered "Salam alaikum" on the part of the caller. The Sultan made no reply and went on talking to me without getting up, and the callers departed without sitting down. He asked if I had news of the result of the General Election in England, and whether the Reparations question between France and Germany had been settled. I could give him no information on either subject. He seemed quite up-to-date in his knowledge of Western affairs, and I took it that he would hear of anything conclusive before I did. I told him of the arrival in London of the Arabian ostrich he had sent to Sir Percy Cox, and that a great many people had been to see it, while the Oryx he had presented to the King was still alive in the Zoo. I said I hoped to shoot an Oryx, but he did not seem to think it likely. There had been no rain for years, and they had all been driven away far to the South. The only place where they were heard of nowadays was in the desert, near Najran, and the Arabs who hunted them had to exist entirely on camels' milk. At the second round of the coffee I suggested that I ought to interrupt him no longer and asked leave to depart.

I glanced out of the corner of my eye at the assembly near the door, and could only recognise Muhammad

Effendi among those seated on the floor, but the soldiers told me about some of them afterwards. One of the attendant squires was Thedhan, a Shaikh of the Ajman tribe, who only five years before was leading open hostilities against the Sultan; he had since made his peace, and had a place of trust and honour at Court, and wore a bright red cloak. Incidentally, as he went everywhere with the Sultan, it was possible to keep an eye on him. Another honoured guest, who travelled in as much state as one of the Sultan's sons, and was equally indispensable in the entourage, was the young heir of Hail, Abdulla ibn Rashid, accompanied by his brother Saleh. They were taken in charge at the capture of Hail by the Sultan's forces. The previous heir to the throne, who was also taken, is said to have found compulsory entertainment at the Court of the conqueror too irksome, and he was shot while trying to escape in the disguise of a woman. Some of our own light-headed politicians, who go so far as to state that murder is justified if it can be said to be committed with political aims, would find their spiritual home in Hail, for Philby, writing of the year 1917, says: "Between Abdulla and his great-grandson Saud, who now rules at Hail, no fewer than eight sovereigns have sat on the throne and all of them have died a violent death except one" (*Heart of Arabia*, Vol. I. p. 381). Later still, in 1920, Saud was assassinated at the age of twenty-one by a cousin in his 'teens. This is the family tradition of blood and intrigue in which these two youthful Arab princes were reared. It will remain to be seen whether they are content with the comfort and security that is theirs at the Sultan's Court as long as they abstain from intrigue to regain their independence as rulers of Hail. Jabal Shammar is now administered by an Amir appointed by the Sultan of Najd, with a residence in Hail.

Two more princelings had arrived, both small children, Khalid and Muhammad. They were not at the reception, but I saw them being taken round the sights of the town

afterwards, with a following of attendants and slaves. Khalid is the son of Sad ibn Saud, the brother of the present Sultan, who was killed by the Ajman tribe, and Muhammad ibn Saud is his first cousin, being one of the sons of the Sultan. Being about the same age, twelve years, they were always together, although they had separate houses and establishments of their own.

[*January 17.*] As it was Thursday, there seemed to be nothing better to do than to go and watch the market and be within call in case a message came to say that Faisal would be able to receive me. We had not been at the window long when Muhammad Hasan exclaimed : "Here comes Shaikh Abdul Aziz." This is the colloquial style usually given to the Sultan, especially by badawin, occasionally varied by that of "the Imam," more rarely, "the Sultan." He was walking across the broad and crowded market towards Qusaibi's office with a following of about fifty of the Court (Plate 24). It had evidently been a sudden inspiration of his to pay a surprise visit to the Qusaibis, for no one was prepared. We saw him disappear in the doorway below and then heard the shuffling crowd coming up the stairs. Muhammad Hasan, who thought they were coming to the veranda where we were sitting, looked as if he wished he could sink into the floor. Our retreat was effectually cut off, or I think he would have fled from sheer nervousness. Luckily they entered one of the big reception-rooms, and our corridor was soon filled with an overflow of attendants and slaves, some in bright red cloaks, some in dark blue, with swords of silver or gold according to rank. Presently Abdulla Qusaibi came to me, looking very worried, and said : "The Imam has heard you are here, and would be pleased if you would join them, if you care to."

When I entered, the long room was surrounded with people. The Sultan was sitting by the window-seat, lightly skimming through a book that had been lying on a little table, reading a passage here and there and dis-

cussing it with the people near him. He shook hands and motioned me to a seat next but one to him. Between us sat an Arab who seemed to be an authority on everything under the sun. The Sultan asked if I had any news of the English elections, but I had none. I explained that the election was being fought on the one issue of Free Trade *versus* Protection. This started a discussion as to the amount of tariff charged in England, and my neighbour settled the question by saying that it was one-fifth. The next question was, what month it was in England, and what day. My neighbour again answered, January, and the day the seventeenth, but he looked at me for confirmation of this. The conversation then turned to Kuwait. As a Conference was then sitting at Kuwait, where matters of political importance were being discussed by representatives of various Arab States and the British Government, and I was anxious to avoid being led into any conversation in which local politics were discussed, this seemed a case for caution. However, I need have had no fear, for all the talk was about fleas. As far as I can gather, they are numerous on the coast and rare, if not unknown, in the interior. I certainly found none, nor did I hear of any except on this occasion. As the Sultan was interested, my well-informed neighbour gave the company a long dissertation on the life-history of the flea, which lasted till light refreshments arrived, in the shape of a box of pink English wafers, a bowl of local jam, and some *halwa*, a sticky kind of Turkish-delight. The Sultan asked what kind of jam it was, and as no one knew, our host, Abdulla Qusaibi, was called and explained that it was peach jam. He apologised for the smallness of the feast, saying that market-day was a busy time for them and they did not bring much food to the office. One of the Court asked him why he offered them jam without bread to eat it with, and he turned to rush off for bread, but they laid hold of his cloak and explained that they were only joking. The Sultan ate one cube of tinned pineapple, and



24. THE SULTAN WITH HIS COURT CROSSING THE SUQ AL KHAMIS, HUFUF. QUSAIBI'S NEW OFFICE ON LEFT.



25. THE UNIFORM OF THE IKHWAN.

I rashly embarked on a piece of *halwa* because it was nearest. It was like birdlime, for I could neither get a piece off the plate nor change my mind; it stuck to my fingers and came away with my hand in a long elastic string that was difficult to disengage. The Sultan then rose and took his party to call on another big merchant who had an office next door.

In the afternoon a message was brought to say that Faisal ibn Saud was ready to receive me. In Arab clothes and carrying the large ivory-handled hunting-knife with many gadgets which I had brought as a present from London, I made my way to the house. He was in small but comfortable quarters, and his reception-room was packed on both sides with people. A camel-saddle and sheepskin rugs occupied the top end of the room and against these he was reclining. Everyone got up when I entered, but I shook hands only with him, and he motioned me to the other side of the camel-saddle. He is of a serious temperament and was possibly a little shy, till I produced a smile by asking if this was the Carlton Hotel. He had forgotten some of his London experiences, but others he remembered well, and he asked after the sea-lions at the Zoo. He thought he should have enjoyed his visit to England better had it been summer instead of winter, for he had found it very cold and had also been rather unwell at that time. A nice-looking, well-dressed man had entered at the same time as I, and had settled himself close to us without ceremony. I asked afterwards who he was, and found he was a trusted member of the Sultan's Court, doubtless sent to report at headquarters the substance of our conversation. The Sultan's experience of the murderous dissensions that take place among brothers eager to secure the succession for themselves by removing others with a prior claim has made him careful. While establishing his eldest son, Saud, as the heir by allowing him gradually to take the reins of government, Abdul Aziz is ceaselessly on the watch to detect any ambition

on the part of the younger sons in that direction. It is for this reason that they go wherever he goes and are always under his eye. On realising this I forthwith determined to use the utmost discretion in my dealings with the Sultan's family so as to raise no jealous feelings or suspicion, and to communicate with them only through the Sultan himself.

The young prince seemed pleased with the knife and asked the functions of the various blades. I had explained the saw and other things, when up came a corkscrew I had not noticed, an article not quite so appropriate as the others for total abstainers, as it was just the right size for a whisky bottle. I said I did not know what it was for, but thought it would be useful for removing the wads from a cartridge. Faisal had just reached the age when a boy fancies little affected catch-phrases, like those a freshman uses to assure his old schoolfellows and himself that he really is at the 'Varsity, such as, "Isn't it amazing!" Strangely enough, this was exactly what Faisal had adopted, and to hear it reiterated in Arabic after most of his sentences was most amusing. After the second round of the coffee-pot I prepared to go, but he laid hold of me and kept me until the censer had passed round. The clouds that had gathered in the South as we returned raised my hopes that rain might be falling there.

There is a substantial arch leaving the centre of the new Palace and crossing the road to the Wahhabi or Ikhwan mosque (Plate 19). This enables the Sultan to join the congregation for prayers without going through the crowd. He also remains apart during the service, for he prays in a gallery while the Governor joins the rest on the floor of the mosque. When the new buildings are completed as planned, the Governor will have a small reception-hall adjoining that of the Sultan, but separate from it, and the latter will have four separate residences all adjoining the Palace, presumably one for each of his four wives.

[*January 18.*] The lucerne growers were not without

their particular insect pests, although up till this time the crop had looked the perfection of vigorous growth. The enemy was the green larva of a sawfly that had stripped whole areas of leaves within a week and so brought about the death of the plants. I had no microscope to examine these destructive insects, but found that the eyepiece of the theodolite made a fair substitute.

The camel disease, *farab*, a kind of mange, was very prevalent this month, and some of the badawins' camels had lost nearly all their coats. Those employed in the caravan trade are worked even when badly affected, their owners centring their faith in a dark oily substance which is smeared on the bald patches. The Governor's herd were so far quite healthy, but both he and some of the tribes segregate affected beasts in separate camps in addition to applying the plastering process. The Government camels are not allowed to breed, as they are required often for quick journeys by the soldiers. The others, however, were dropping their calves, and we passed several only a few days old.

[*January 19.*] We spent the afternoon in pursuit of the Rock Lizards or Geckos living in the clefts of the sandstone hills. They have round lobes on the end of each toe, which act as suckers, and had hitherto been impossible to collect, as they succeeded in vanishing into the recesses. To-day I took the shot from the .410 cartridges and filled them up with sand. The surprise of the explosion and the blast of sand made them drop to the ground, and we caught several by this method, its chief drawback being that the muzzle of the gun has to be so close that if the wad strikes the animal there is very little of a specimen left. On our return to the town we found the gates of the Kut quarter closed against us, as it was almost time for the evening prayer. While this is a regular custom in orthodox Riyadh, it had not hitherto been practised in Hufuf, and was evidently done in deference to the Sultan's presence, or perhaps by his orders. The

innovation was obviously not popular, and was slightly resented even by the soldiers who were with me, and before there was time for me to realise the situation one of them had banged lustily on the woodwork and demanded that it should be opened. Had any question been raised at headquarters, I knew he would have weathered the storm by passing the onus on to me to shield himself. It was then too late to move away and await the end of the service in the mosque, for the bolts were hastily drawn; we therefore rode in, a crowd of people who had been similarly excluded seizing the opportunity to slip in with our party. I always contrived to avoid arriving at that time during the rest of my stay, and I heard no more of the episode and took care not to inquire.

[*January 20.*] A bright day and no wind. It was certainly more chilly at night than before, but the oil stove which is essential to comfort in Baghdad houses was not required here. I slept in my valise with the cover roped up, with four blankets and a sheet above, and one sheet and a local mattress stuffed with cotton below, and was warm throughout the night; and there was one wool rug in reserve if it should be needed. In Iraq, in addition to all these, I used to throw an overcoat over the whole pile, and even then felt chilly towards morning. In Hufuf it was cold before the sun rose, but the sun warmed the air very quickly, and it had shone every day since I came; even on cloudy days it had come through at intervals.

Muhammad Hasan came in suddenly to say that the Sultan was ready to inspect the collection. As there were about forty small birds, each separately wrapped up in cotton-wool, besides the two Eagle-Owls and the mammals, and as I had to dress, there was no alternative but to keep his Highness waiting. Relays of slaves and attendants came at intervals to suggest that I should hurry, and Muhammad Hasan got more and more perturbed, for I would not allow anyone else to touch the skins. At last, after a quarter of an hour, we started off with several trays

each carried by a separate official, making a goodly procession.

I hastened to apologise for being late and to explain, but the Sultan passed it off gracefully and even said that he had nothing to do, although we had passed a long queue of people waiting to see him. He displayed more knowledge of the different species than any educated Arab I had yet encountered. The usual native classification of the fauna is limited to two divisions, eatable and not eatable, and even the more advanced students, especially sportsmen, could distinguish only the Bustard, Sandgrouse, Falcon, and very little else. The Sultan was most interested in the Eagle-Owl and was not satisfied with the Arabic name of *Booma*, since he said it applied to all Owls including the Barn-Owl, which he called *Umm al Sakhr* (mother of rock); but try as he would, he could not recall the correct name of the Eagle-Owl, so he appealed to the assembly. Then began a brain-searching such as was never seen: no one present knew, or would ever have been curious to know, the name of an Owl, but at the moment anyone would have given anything to be able to answer the question. After a dead silence in the room the missing word came to the Sultan. "*Fayum*," he said. "*Fayum*," repeated everyone, much relieved, "*Fayum*, of course it is." I then told him how pleased I was to have found the Desert Lark (*Ammomanes*), of which we had obtained a single specimen on the way to Salwa, some three years before; the other specimens we required now lay before him. "It is the *Hamra*, one of our commonest birds," he remarked, when I explained that it would probably prove a new bird to ornithologists. It has since been named *Azizi* after him. The big Desert or Bifasciated Lark (*Alæmon*) produced a smile of recognition as of an old friend. "*Umm al Salim*," he said. "Don't you find them in England?" He admired the Bats and Jirds, but did not touch them. It seemed to puzzle him how small birds, such as the Wren Warbler,

could be shot with so little damage, even with a collecting gun, and he went into raptures over the bright blues of the Kingfisher and said he did not know such a beautiful bird existed in his country, as he had never seen one before.

When coffee came, the conversation turned to motor-cars, a subject of vital interest to him at the moment, as he said he was expecting one of the Citroën caterpillar cars. Ordinary cars were well enough on the hard sandstone at Riyadh and Hufuf, once they got there, but the sand-belt of the Dahana was an obstacle to easy communications. With the Citroën he hoped, not only to connect these two towns, but also to cross the sand-belt to the coast at Oqair. He was anxious to know whether, after crossing the sands, the caterpillars would refuse to run on the hard plains, and was relieved to hear that according to reports they ran equally well on both. He realised that if he could travel direct from Riyadh to Oqair in one car, it would revolutionise the whole transport of his country. That is, the journey from his capital to the coast, which could hardly be done by camel in less than a week, would be accomplished comfortably in two or three days. I pointed out that he should have a mechanic with special knowledge of the caterpillars, to begin with, to avoid disappointment, as the Indian drivers or Arabs trained in Bahrain, who were at present in charge of his mechanical transport, could only be expected to make a wreck of special machinery they did not understand. He went on to say that he had one big car in Riyadh and several Fords. I had heard that the big one was a Crossley and that it had taken forty camels to pull it over the dunes. The Fords he was not quite so satisfied with, as they had a tendency to tip over. It is a wonder that any car keeps right side up where Arab drivers are concerned; they have fair hands on a horse, but none at all at the wheel, and never acquire sufficient proficiency to become, so to speak, part of their car. With an actual spill as the sole check on their speed, they

have only to encounter an unnoticed hole or a too rapid turn, and a somersault is inevitable.

He then asked wistfully if I had received any news. He seemed to be pining to hear something, but I could truthfully say I had none. He was most careful not to touch on political questions and did not even lead the conversation into dangerous zones, tactics a mere politician would certainly have attempted. In short he observed the whole spirit of the arrangement with Sir Percy Cox, that my visit was to be unofficial, whereas a smaller man would have given me many difficult moments. We finally touched lightly on the prospects of my next journey. His opinion was that the Jabrin proposal presented great difficulties owing to the drought in the South. He even seemed to think it would be easier for me to travel across the country and go out by the Red Sea through Yaman, as he thought that road would be sufficiently peaceful at the moment. However, he must consult Shaikh Abdulla, the Governor, and would let me know in a few days. Having set my heart on getting into the Great Desert and seeing Jabrin, I did not consider this conversation at all encouraging, and I went home depressed in spirit. Albeit the long trek would provide a certain amount of compensation, little of it would take in entirely new country, and it promised the solution of geographical problems of far less importance than those of the Wadi Sahba and the mysterious oasis of Jabrin; and as the way would skirt the desert on two sides we should still be ignorant of the fauna inhabiting the interior.

[*January 21.*] An eventful day, with a fall of rain roughly estimated at one-sixteenth of an inch, sent the barometer of my hopes for Jabrin up several degrees. The clouds on the previous night appeared from the westward first as a thin film, and gave the moon a wide white circle, although then I hardly dared to hope it was a sign of rain, as it is said to be in England. The first drops were heard pattering on the roof at

4 a.m., and it rained at intervals later and there was no wind. The dust was laid and the roads were sticky. The colder snap of the last few days and the rain that followed reduced the swarms of flies in the house, but the Martins still seemed to be catching some over the bazaar. In the afternoon a thunderstorm came up from the west, and although the centre of the cloud passed as usual to our north, we got an additional sprinkle from the fringe. But at dusk a heavier storm passed to the south just when the call to evening prayer was resounding from many housetops, and the tones of the *Adthan* were mingled with the crashes of the thunder, and sometimes drowned altogether by the louder peals. My aneroid barometer went up one degree before the storm and dropped after the depression had passed away.

[*January 22.*] I spent the morning packing the next two boxes of skins for England. Muhammad Hasan brought in one of the brass-studded wooden milk-bowls. In Bahrain one was told they were made in Hufuf, and in Hufuf they were supposed to come from Riyadh and were not easy to get. They are roughly carved out of tamarisk wood and are very ornamental when picked out in patterns with small tacks of silver or brass. They are liable to split with age, and a strip of leather is wired along the crack so neatly that the bowl remains perfectly water-tight.

The peaceful town was disturbed during the day by rifle shots fired close to my house. As the firing got nearer, I looked out of the window and saw two camels, each carrying two badawin, one on the saddle and one on the hindquarters, jogging past towards the Palace. The first man was loading his rifle and firing it in the air as fast as he could, calling out "Allah akbar" and other sentences. I asked what it was all about and was told it was the custom of the Ikhwan (that is, the soldiers) when they brought important news for the Sultan, to fire a rifle in that way to give warning of their approach. I asked if they

ever killed anyone and if the rifle was loaded with a bullet. The answer was, "Yes, the Ikhwan do not carry blank ammunition, but they are careful to fire in the air, and the bullet then becomes cold and would not hurt anyone if it did hit them. If they fire along the ground the bullet is hot and kills people." The Wahhabi science of physics has not been complicated by the problems of gravity, and this simple solution is accepted by everyone. If anyone does receive a spent bullet on his head, I suppose he says it is Allah's will and nurses it as best he can without ever trying to find out where it came from. My military staff of two were very quickly out of the house and joined the rush of excited townsmen to the Palace to catch any gleanings of news that might fall from the lips of the messengers, and I learnt that the Ikhwan had taken the town of Najran, an oasis to the south beyond the Great Desert. It was the first time I had heard that the Ikhwan were investing the town, and as it was equally incumbent on me as on the Sultan to maintain an unofficial attitude, I asked no more questions. The direct way from Najran to Hufuf would be across the Great South Desert, but I found these express messengers had preferred the longer route, that is, along the outskirts on the western flank, using the oasis of Dawasir and Aflaj, to Riyadh, and thence along the northern edge to Hufuf. It is certain that, however urgent the message, even an Arab would travel by these two sides of the triangle, the risk of cutting across the desert even thus obliquely being considered too great. In this particular case it was probable that when these men left Najran they did not know the Sultan was in Hufuf, and in that case they would go to Riyadh to learn his whereabouts. The fact that they were estimated to have taken five or six weeks on the journey gives an idea of the slowness of communication between the head of the State and the outposts of the Empire, and of the independent position that must consequently be accorded to his commander in the field.

Soon after the excitement had abated a cavalcade of horses was heard passing, and I was just in time to see the Sultan ride by, escorted by an odd assortment of mounted courtiers, on his way to a feast given by one of the big Hufuf merchants in his garden. Most of the horses were hardly under control, and the riders' clothes and the horses and their trappings looked as if they might go in different directions at any moment.

[*January 23.*] A grey morning. Clouds were low and a fog hung over the town with occasional spatters of rain. According to local opinion, this was the wettest year they had had for three years, but the total so far could only have been about a quarter of an inch.

The Sanitary section of the administration gave a display. A lot of noise attracted me to the window, whence forty men could be seen hauling on a rope that issued from the house next door, used as a guest-house for any Ikhwan Shaikhs who may be staying in the town. At length a huge dead camel appeared on the end of the rope and was manœuvred by heaves and jerks down the narrow street. It was comforting to think that some organisation existed for dealing with these matters.

The feeding of all official visitors and their staffs as well as all the soldiers must be an enormous expense, and must entail commissariat arrangements on a grandiose scale. The soldiers actually feed as part of the Governor's establishment. There is no such thing as one dish for the General and another for the private, and the soldier is not rationed. The only privilege of the Governor is that he and his family feed first and have first pick. When they get up, the subordinates fall to until the platter is bare. The Governor has a whole sheep killed for every meal and, of course, huge dishes of boiled rice are consumed.

[*January 24.*] A south-west wind brought a thunder-storm that looked heavy to the south and laid the dust in Hufuf. Another storm came up when the Thursday market was at its height and sent people helter-skelter

into the covered market and houses, besides being made noteworthy by the appearance of three umbrellas, whose proud owners looked ridiculously self-conscious as they strutted about enjoying their short-lived prestige.

Muhammad Hasan, who was sent away yesterday to find and bring in a law-breaking badawin, and was expected to be away five days, turned up at noon complaining bitterly of stiffness and soreness from riding a not very comfortable camel with a rough trot. He and a companion had ridden all night and had surprised their prisoner asleep in his tent. He had offered no resistance. The nomads offered them food and rest, but the soldiers bound the man hand and foot, tied him behind one of the camel-saddles, and started without a moment's delay, and had safely landed him in jail. If the man on the saddle was sore, it is conceivable that the captive had a still less enjoyable ride. Muhammad Hasan's despatch in carrying out the mission was partly due to fear lest another soldier should supplant him in my service. In spite of protestations to the contrary, he was very pleased with his position ; it was not hard work, he got good food, and he looked forward through rose-coloured spectacles to the handsome present he thought he was qualifying for when I went. He sometimes confided in me that the people in the bazaar sneered at him and said, " Here comes the friend of the Englishman ! " Of course, he would add, he only had to say one word to the Governor, when those people would be brought up and beaten, but it was more dignified to ignore them—in which I agreed, complimenting him on his diplomatic handling of a very difficult situation.

The soldiers were saying how much stricter a disciplinarian Shaikh Abdulla was in comparison with the Sultan. He was the strong man of the Empire that the Sultan had built up, and one of its main pillars. I myself noticed in one particular case the difference between the two. On my second visit to the Sultan he had told the

man who brought the tea that the sugar should not be put in beforehand, as Englishmen liked to put in sugar and milk for themselves. On the next occasion the tea came in as before, with sugar and milk already added, though I should have taken no notice had not the Sultan rebuked his servant for his forgetfulness; whereas if the Governor had ordered sugar and milk separately his instructions would have been followed implicitly.

I had grown weary of my walks in the gardens. I felt I knew each bird individually, and I found my attention always drifting towards the clouds and their promise or otherwise of rain in the South. The soldiers had been warned to make light of any rain that fell, in order to keep me quiet, and even sharp showers were pronounced to be insignificant and not sufficient to start the bushes in growth. After one shower that was probably pretty copious for that country I adopted fresh tactics, and when Muhammad Hasan paid his usual call for orders, I requested him to ask Shaikh Abdulla for horses so that we might ride out at once to Ayun to shoot. He fell straight into the trap and said that it would be much too slippery, and we should have many falls. I answered that the rain had only fallen round the town and not outside. "Yes," he replied, "lots of rain fell everywhere last night." "All right," I said, "I don't want to go and never did; I merely wanted to know what you really thought about the rain. And now, as I don't want to go out, you can go to Shaikh Abdulla and tell him there have been heavy rains all round." An Arab appreciates a joke even against himself, and he went off chuckling and no doubt repeated the conversation verbatim to his master.

[*January 25.*] Abu Saud, the other soldier, escorted me to the south-west corner of the town and out on the Riyadh road, as we had never been that way before. It passes first to the south of the Kut wall and thence westward through the Na'athil quarter. This seemed more squalid and dirty than the rest, with smaller houses and

nothing of interest but a plain mosque which, from the absence of decoration, I took to have been built according to Wahhabi ideas. We passed two women beggars squatting by the roadside, who asked me for alms in the name of Allah. This might at first sight seem unimportant, but it was the first and last occasion during my stay on which I saw any begging. The scarcity of paupers and beggars in the town is a remarkable feature of pure Arab societies. Family pride compels people to support their indigent relatives to a greater extent than in most other nations, and the racial temperament, though hospitable to a degree, prevents them from weakly giving to anyone who has the temerity to ask them, so that pauperism is not encouraged. Fakirs and other religious mendicants do not flourish in a Wahhabi atmosphere as they do in Persia and India, and consequently they do not exist. The only other case that came to my notice was on rather a different footing. The residence of the Sultan adjoined my house, and one of the doors was overlooked by my veranda. After the hour of the evening meal some little children used to come regularly to the great iron-studded door, like carol-singers, and sing the praises of the Sultan, mixed with lines from the Quran, such as, "Allah, bless Abdul Aziz," "Allah is merciful," etc. Soon the bolts would be drawn, and a bowl of rice would reward their efforts.

The south-west gate is one of the chief exits for Najd, and therefore the roadway is much worn. There are date-gardens close to the town on both sides of the road, but they are watered by water-lifts from wells that do not flow. There is a fort called Khizam three-quarters of a mile from the town. Khizam signifies a camel's nose-ring and the fort is so named because he who takes it is supposed to have command of Hufuf. Palgrave, who appears to have remembered the story and forgotten the name, re-christened it Khoteym, or Bridle-Bit, when he wrote his *Central and Eastern Arabia*. On our left was the large

badawin encampment, where any of the tribesmen who have business in the town, or are engaged in caravan work between Oqair or Riyadh, pitch their tents near wells. About twenty miles away and on the horizon were the distant hills called Jabal Ghawar that lie to the north of the Riyadh road and make a dark foreground to the setting sun. We walked round the extreme edge of the palm-belt west of Hufuf, lying in a depression not more than a mile from the town walls and running in a continuous line to join the gardens to the north. Southward the palms do not cross the Riyadh road, and are watered by the most westerly of the flowing springs, Ain Pariya. Our road took us through the plain outside the palm area with Jabal Abu Ghanima on the horizon to our north. During a circuit of four or five miles I obtained a lot of detail for my map of Hufuf. Until we once more plunged into palms on our way home we walked mostly through soft sand, which is encroaching on the gardens from the north. Efforts to stay its advance have been made by planting rows of tamarisk trees or erecting fences of palm branches. The part free of loose sand was salt-land or *sabkha*, and was much easier to travel on. Since it is lower than the garden level, the water from irrigation comes up under the sand and evaporates, leaving on the surface a precipitation of salt which seems very effective in delaying sand encroachment.

Mehdi had a successful hunt for literature in the bazaar, and produced several numbers of the *Sketch* and *Illustrated London News*, from three to five years old, at 8*d.* each.

[*January 26.*] *The Times* of December 13 arrived this morning with the results of the election; the two previous issues had apparently miscarried. Some Christmas pudding and chocolates kindly sent from Bahrain by Mrs. Daly also failed to report. I am afraid they fell among thieves, but this was the only case of my letters or parcels going astray, and luckily I was saved much anguish by not hearing of the loss of the pudding and chocolates until I had left Arabia.

When the Sultan sent me an invitation that afternoon, I flattered myself that at last I should be able to give him some news, but he had read it all in a Damascus newspaper received by overland mail via Baghdad. On my asking whether he had any good news for me, he had some suggestions to make. The Jabrin journey would be possible, and he could arrange for me to go there as soon as reports of sufficient grazing came in, but further south than Jabrin would be out of the question, and it would be necessary for me to return to Hufuf. The political situation around Asir and Yaman made it impossible for him to send me out by the Red Sea. Everything was topsy-turvy, as he said, emphasising it by rolling one fist over the other. He explained that he was not on good terms with the Hejaz. He was afraid that conditions on the boundary of Asir would be unsafe for a traveller, as he could not give me a safe-conduct to the Idrisi. Although he and Yahia of Yaman were like brothers (demonstrating that they saw eye to eye by placing the first fingers of each hand together, as all Arabs do when mentioning friends), yet Yahia's Government was not strong enough to control his outlying hill-tribes, through which I should have to pass. I asked about going to Riyadh, and he inquired: "Where do you want to go afterwards?" I replied that my chief interest in the interior would be in the highest hills, where one might expect to find different birds. He said he did not think that many birds would be found anywhere, but the hills of Jabal Tuwaiq were high and were only two or three hours' ride from Riyadh; so we provisionally decided that I should go on to Riyadh on my return from Jabrin and should come back by the same road whereon I went.

It was during this interview that I must have perplexed the Sultan, when he said I could go to Jabrin, by asking if I could also go to Jafura, the vast desert which has to be crossed on the way to Jabrin. I have already explained that Philby's map, which places Jafura to the south of

Jabrin, had misled me, and the error caused several amusing complications with my Al Murra guide on the actual journey.

The Sultan has two brothers still living, Muhammad and Abdulla, as well as his father, Abdul Rahman ibn Faisal, who leads the life of a religious recluse in Riyadh, leaving the affairs of Government in the able hands of Abdul Aziz, the present Sultan, and his heir Saud.

[*January 28.*] I spent the day on the large reed-bed of the well Umm al Saba. It was about two miles long by half a mile wide and, having flushed in the rushes there the only Black Partridge I ever saw in the oasis, I had a faint hope that if the reed-bed were done thoroughly from end to end I might secure some specimens—a vain hope, as events were to prove. At the first glimpse of the high rushes in which Mehdi and I were splashing and plunging, the two soldiers decided they had better remain on guard outside. Parts of the tangled growth were so thick that we could only make our way by keeping to the tracks of Jackals, which proved to be almost the only living inhabitants. There were open sheets of water surrounded by rushes that were absolutely deserted. Nowhere was the water more than two feet deep, so we could wade over the whole of it. In the clear spaces the rushes and their roots could be seen to be coated thickly with saline incrustation to such an extent that the bottom looked like a coral sea. There was no insect life moving, nor were there fish or frogs. The presence of the salt seems to be the explanation of its sterile condition. The lake is a big spill from the gardens, the waters drain from the irrigation highly charged with salts, and evaporation in the shallow lake is rapid. At this time of year there was more water in the lake than there would be in summer, as the paddy fields were not requiring any and the surplus was turned direct into the lake. There were no footmarks of Black Partridge on the sandy edges or small islands, and it was evident that the bird was almost extinct in the oasis, a

state of things for which the local sportsmen, one of whom was seen on the prowl, are probably responsible. There were a pair of Moustached Sedge Warblers, the male in full song, and they were evidently in sole possession of this large lake. The song was sweet and loud, a mixture of Whitethroat and Sedge Warbler, but superior to both. The notes would cease when I approached splashing through the reeds, at a distance of twenty paces, and would break out again in a song of derision as the bird heard my retreating footsteps. When, after an hour's endeavour, I did get a view of the bird, it was sitting sideways on a reed stem; it never perched more than half-way up the reeds and was therefore always concealed at ten paces.

A surprise was afforded by the discovery of several specimens of a pale Purple Orchis (*Orchis palustris*) growing among the rushes along the marshy edge nearest the inlet of the fresh water. It resembles in many ways the purple orchis of England, and is found in Continental Europe, but had not been recorded before from Arabia.

The Sultan's son Faisal, and the two small boys, Khalid and Muhammad, were having a bathing picnic at the hot spring of Umm al Saba about half a mile from us, and my two soldiers yearned to join the festivities, more especially when we sat down to a frugal meal of dates almost in sight of roast chicken and other delights and unlimited coffee. I remained adamant, still hoping that the afternoon might reward my labours with at least one Black Partridge. Had it been possible to foresee the dreary blank that lay ahead, I should have given way. The picnickers could be heard spending the afternoon in rifle-shooting matches, the target being a small mark stuck up in a sandhill, varied with the horse-races and equestrian feats that delight the Arab heart, and judging by the shouts and laughter the fun must have been fast and furious.

Our mounts that day had for the first time been donkeys. They are much more satisfactory than horses. You sit sideways on the saddles, and they go along at a steady six

miles an hour without tiring you, and it is much quicker to get off and on again when shooting a bird or picking a flower than it is with horses. I had been suggesting donkeys for some time, but it was a delicate matter, as it might be taken as a vote of censure on the Governor's stable. Now that he was hard put to it to horse the Sultan's family on their outings, it made a good excuse for my request to ride the humbler quadruped. The news that one of the mares had fallen and thrown the Sultan's young son on the return from the picnic was not surprising. The boy was luckily unhurt, but the animal had been badly cut. It was one of the beautiful mares that I had myself ridden, and only its untrimmed and overgrown hoofs made it in any way unsafe.

[*January 29.*] Letters were received, dated London, December 20, with yet another reminder from the Income Tax authorities that a certain form I had already filled up and returned had not reached them. Correspondence with these gentlemen in a place like Hufuf is an expensive proceeding, as each messenger who brings one of these missives expects a tip. There was also a calendar from the British Museum (Natural History) bearing a picture of a blue butterfly, which was much admired as it adorned the walls of the guest-house (one visitor even asked how it could be renewed at the year's end); also a card asking if I should be present at the Dinner of the British Ornithologists' Club in London on December 12.

In the afternoon rain fell for twenty minutes, our longest shower. It all helped to speed the parting guest to Jabrin.

[*January 30.*] Several showers fell during the night, in all perhaps a quarter of an inch since yesterday. The roads were muddy for the first time and too slippery for animal traffic, and the usual patter of donkeys past the house was strangely silenced.

[*January 31.*] A dull grey morning with another fog hanging over the town. The importance of these fogs

is very great in the economy of all life in the waterless deserts outside, where, in rainless years, both plants and animals are entirely dependent on these and on the dew to provide the little moisture necessary to tide them over to another season.

The rain we were getting at this time was supposed to be that of a normal year. The year before not a drop fell, and three years ago, during a storm, the streets of Hufuf were like running streams, and the puddles remained for a month or two before the mud was dry.

The Thursday market was more crowded than usual, and as an expectant crowd was collected on each side of the Kut gates I thought they must be waiting to see the Sultan. I was enlightened by the soldier, Abu Saud, who said they were waiting to see a man who had been convicted of thieving from a shop in the bazaar, and had been sentenced by the Sultan to have his hand cut off and afterwards to be paraded in the market as a deterrent to other intending pilferers. The crowd, which rapidly grew to remarkable proportions, reminded me of pictures of a Tower Hill execution. The best seats and points of vantage were crowded three and four deep, and occasionally the custodian of the door appeared with a stick and his most official manner, driving off those who were smaller than himself in stature or position and discreetly leaving the others alone. But the audience were doomed to disappointment, for it had been reported that the prisoner had been dashing himself against the walls of the prison, and the Sultan had accordingly delayed execution of the sentence to allow him to produce witnesses that he had shown signs of insanity on any previous occasion. Satisfactory evidence had been forthcoming, and the sentence had been changed to transportation. So now he would be taken on a donkey with a soldier as escort to Oqair, and put on a boat bound for other climes. This was a typical trial and sentence by a man who has been represented as harsh, cruel, and bigoted. It seemed to me to be a decision of well-balanced justice

tempered with mercy. The cutting off of the hand is a punishment that to us seems primitive to-day, but it is generally accepted for that particular crime in the Arab legal code as well as by most Eastern potentates; and there is this to be said, that a mere term of imprisonment would not be looked on by the wild tribesmen as any such disgrace as it is in more modern civilisation, and therefore more vigorous methods are necessary if a deterrent is to be found.

The crime considered most heinous according to Wahhabi law is murder, and conviction is followed by public execution with a sword. The culprit can, with the approval of Government, escape the death sentence by paying blood-money. Cases of immorality in either sex are also severely dealt with. Those convicted are publicly beaten with a date-palm stick and expelled from the country. The extreme sentence is 100 strokes; some of those who undergo it survive to be banished, and some die. The system of dumping undesirables on to a friendly neighbour is not so one-sided as it appears, since the Shaikh of Bahrain also finds the boats sailing for Oqair a ready means of giving any of *his* unruly subjects a change of air, thereby keeping up what might be called an exchange of prisoners. Most of the other offences are settled by fines assessed and regulated by the Sultan or his Governors.

I tried to find out about Jabrin from Muhammad Hasan. He said he had never been there, and all he could give me was hearsay evidence. Very few of the soldiers had ever seen the place. Occasionally two might be sent with a message or to collect taxes. There was only one well on the road, of which he did not know the name (it was Zarnuqa). The climate in hot weather was unhealthy and sent people yellow, and made them cough; they called the disease a fever. The accounts of Jabrin given by Muhammad Hasan and Muhammad Effendi both tallied well with Philby's account of Jafura, substituting Jabrin

itself for his deserted city of Jafura. The Effendi had already spoken of the spirits moaning round the deserted buildings, and now I heard from Muhammad Hasan of the camels that drink at the Jabrin wells and are driven forth into the sands, to return of their own accord to the watering after three or four days.

At this time the Al Murra tribe were grazing their herds north of the Hufuf-Riyadh road. They had serious losses last year during the drought in the South, and they pay a tax to the Governor of Hasa in return for permission to come to the Hasa. The failure of the grazing in the South makes the tribe entirely dependent on the northern part of their territory, and places them more than ever in the hands of Shaikh Abdulla, whose permission has to be asked, and their good behaviour is thereby ensured.

The gardeners were preparing and sowing melon beds in the sun-bathed portions of the gardens where there is no shade from date-palms. This was much earlier than would be possible in Iraq. We saw some gardens also where Brinjals were in flower and bloomed throughout the winter. They were mostly irrigated by the hot water from the Umm al Saba spring, which must have a forcing effect, but in Iraq the cold winds and night frosts cut down the leaves and flowers of this plant and make a winter crop impossible.

[*February 1.*] I was roused early by one of the soldiers, who said that a chamberlain from the Palace had brought one of the royal slaves who was suffering from a "temperature" under the arm, with a request from the Sultan that I should see him and do anything I could. The patient was a most unintelligent nigger boy. The boorish stupidity of most of these Central African negroes makes a sharp contrast to the quick wit of the Arabs. On one occasion I was taking a photograph in the street when one of them came up and laid hold of the camera merely to satisfy his curiosity as to what was in it, with no intention of being rude and no idea, of course, that I was not an Arab. He was

immediately pushed away by the indignant soldiers. "Animals," they explained to me. "Nothing but animals." On examining my patient, I found a large swelling below the arm, which he said was painful and had been developing for a fortnight, and visions of plague flashed across my mind. However, I could only treat it with iodine, which, if it did no good, could do no harm, recommending at the same time that he should see a doctor. There seemed little hope of this, as the only doctor in the country was out of reach, having left Riyadh on a visit to Buraida. As soon as he had left, I hastily turned up symptoms in *Hints to Travellers* and got little comfort thereby, for, sure enough, swelling under the arms was given as a sign of plague; but I derived a little comfort from the fact that the size was given as that of a hen's egg, and this boy's was as big as a goose egg, and was, moreover, rather low down to be described as under the armpit. I also reflected with satisfaction on the absence of fleas. I was relieved to hear that the patient had been taken to the local barber and doctor for further advice and treatment.

The chief characteristic of the Ikhwan dress is the white *imama* bound round the head without the usual *aqal* or band of white or black wool. The loftier the status of the wearer, the larger the *imama*. No adornment of the person is favoured. The white shirt of the rank and file is generally an old soiled garment. An Ikhwan Shaikh would wear a cleaner one. The arms consist of sword, rifle, and cartridge-belt, and a dagger worn upright in front of the stomach, the sheath fixed by a separate belt (Plate 25). In war the Ikhwan use their rifles once only as they approach, and then sling them over their shoulders and draw their swords and fight for the rest of the time with these. This is perhaps a wise regulation for the safety of their friends.

Three common Swallows passed over from south to north to-day. Here, as in England, they are a sign of approach-

ing summer, but they are only absent in the winter months for about eight weeks. There was a sun-dog in the sky, just a patch of colours of the rainbow without the arch, said to be a sign of rain in most climates.

I was honoured by a call from one Ibrahim, a Master of the Ceremonies at the Palace and a gorgeous official withal. He sat down in my room and got to business without delay. "The Imam (the Sultan) sends his salams and is sorry he cannot ask you to come and see him, as he is fasting as a preliminary for Ramadhan"—the month's fast religiously observed by all good Muham-madans, when no food or drink is taken between dawn and evening twilight. I asked afterwards why the Sultan put in extra days of fasting, and the reply was amusing and probably only partially correct. It was that, as he is often travelling during the month of fasting, he sometimes takes food on the journey in the daytime; for instance, my informant said, they might come upon some desert truffles. So he puts his account square beforehand by abstaining for as many days as he is likely to be on the journey.

"I have been sent to say," continued Ibrahim, "that news has been received that bushes have started growing in the South, and the camels have been sent for from the North, where they are grazing. In a few days they will be in, and you can start." This was good news indeed, I was still uncertain what was our destination, though it was almost sure to be Jabrin. Ibrahim continued that time was not calculated to a nicety in the desert, where two or three days was nothing, and I was not to get impatient. He went on, "It is different with your steamboats that are timed to start on a certain day at a certain hour, and they start." I might have observed that the slow mail from Bombay to Basra was sometimes a week late, but we were not splitting hairs. This Ibrahim was the very man with whom Philby had many a fracas on his journey to Wadi Dawasir, and I had been reading

of him not long before. I had hastily taken the precaution of pushing the book under a cushion when he was announced. His next question was, whether I knew Philby. I said I did, and then he asked if I had read his book. A purist would have replied, "You are sitting on it," but I merely answered, "Yes." "Well," he said, with pride, "I am mentioned in that book." I had so far got through the catechism without untruths, but now I braced myself for the next question, resolved to tell a deliberate lie. Luckily it never went any further. I had expected him to ask if I had the book with me.

The news of my approaching departure quickly leaked out and caused quite a flutter among my household. Muhammad Hasan was soon up the stairs, saying mournfully that I was going away, and he would be left in Hufuf. I suggested he should tell the Governor that I should like him to accompany me. He affected dismay at the very idea of his being capable of such presumption, but was afterwards very much preoccupied and left, I think, determined to arrange it somehow. Among other callers came a funny old fellow who had accompanied me to Salwa three years before, and was now obviously on an errand of his own, to see if there was any money going. He said, "Muhammad Hasan has 'salamed' with you," which being interpreted was, "You have given him money, why not me?" We talked over the Salwa journey, and he tried again. "The travelling was not easy, though it was pleasant enough, but there was no 'karush' (money)," said he, putting out his hand and rubbing his thumb against the finger-tips. The hint was so broad that I preferred not to see it, and he left as he came, with nothing but many thanks for having come to see me, although I had intended to give him a small cash present at first.

[*February 2.*] Qusaibi sent round 500 rupees in silver. I had written him a cheque some three weeks before, and he had sent it to Bahrain Bank to be cashed. It

was rather a lengthy business. He did offer to cash the cheque for me at once, but I preferred to test the working of the other plan. To arrange money matters beforehand for a place like Riyadh was not easy, but I had no doubt there would be no difficulty about cashing my cheque with one of the bigger merchants if I ran out of silver.

The botanical specimens took a long time to dry. Many desert species, such as salt bushes and broom rape, have fleshy leaves or stems; and the euphorbia stems are full of a milky juice that flows freely when they are bruised or broken. Several weeks after gathering they are not dry enough to pack, and premature packing away from air makes them mildewed in two or three days. My system was to place the specimens between old envelopes in my note-book when travelling, and on my return to house or camp, they were labelled and transferred to loose sheets of blotting-paper open at the sides and bound in a pad. The orchids collected five days before were quite unfit still, though they had been put out in the sun and air to try to accelerate matters. Mosquitoes had slightly increased of late, but they were all of one kind, *Culex fatigans*, and I had not been bitten once. The bodies look creamy-white and smooth, and the wings shine like a rainbow even to the naked eye, while under the lens the lower or back half of the wing is all iridescent with reds, blues, and greens, and the back edge is ornamented with a fringe of golden yellow.

[February 3.] A south wind of about ten miles per hour, quite a high wind for Hufuf. A forgotten packet of Basra dates of the kind called Hallowi was found among my boxes, and gave me an opportunity to make a comparison between them and the Khelas date of Hasa. The Basra fruit was, of course, better packed, in cardboard cartons containing ten ounces of fruit or about forty dates, whereas the Khelas came from a large skin and it was not so easy to get a separate date. The Hallowi is darker, smaller, firmer and drier, the skin is thicker and coarser,

and the flavour not nearly so good. The skin of the Khelas is almost unnoticeable, the flesh softer and sweeter. The aniseed invariably sprinkled over Khelas dates here, in my opinion, spoils their flavour. The Reziz date of Hasa is about the same size as the Basra Hallawi, that is, they are both smaller than Khelas. The Reziz have a thinner skin and better flavour than Hallawi, and a richer, darker amber colour, and have a bloom like a plum even when dry. The stone is short and fat.

The *Adthan*, or call to prayer, was now delivered at 12.30 a.m. (dawn), 7.30 (noon), 9.30, 12 (sunset), and 1.30 p.m. All these are local Arab times, that is, taken by setting watches at twelve o'clock, when the sun sinks below the horizon. The time-table of a devout believer would be considerably out of gear in Norway or any other land of the midnight sun, but in Arabia the seasonal changes in the sun's movement are not sufficient to make any appreciable difference. Worshippers in Hufuf had no difficulty in facing towards Mecca, as the direction was well known; but once I witnessed an amusing episode on the Tigris, when travelling on one of the river steam-boats with a tribal Shaikh with a reputation for piety and religious zeal. We were coming down on a high flood and were negotiating the numerous bends of the serpentine course at high speed. As the time for prayer approached, a long discussion took place between the Shaikh and his servant as to which direction was that of the Holy City. That having been settled, the menial with leisurely movements proceeded to lay out his master's praying-rug in the required direction. By the time all was ready the steam-boat had turned the corner, and was travelling on almost the reverse bearing. The servant was called and with slightly quickened actions rearranged the carpet; but quicker still moved the current, and before the worshipper had time to commence, he found that the boat had turned again. Once more, with commendable patience, the endeavour was renewed, but all to no purpose, and with

an air of resignation to the inevitable the Shaikh continued his devotions with his back to Mecca.

A deal of latitude is allowed in religious observance in Hufuf. The soldiery and Ikhwan, with whom the Wahhabis in general parlance are synonymous, pray in the big Wahhabi mosque with the Sultan and the Governor, but the rest of the people go to mosques of other denominations of Islam, of which there are plenty scattered around the town.

The wind developed a force of about twenty miles an hour and was gusty. It was unpleasant, as it raised the dust and banged doors and windows.

[*February 4.*] I went to the south side of the town to report the progress of the patches of growing wheat. We found them just coming into ear, and gathered two distinct species. We started through the north-east gate and coasted the entire north and west walls. They are surrounded outside by the sandstone plain, much cut up by quarries and large graveyards. We passed no wheat or cultivation until we reached the few fields that I had previously seen lying on the south of the south wall when the crop was in the two-leaf stage on December 22. I was told by a man who, though not a gardener, was well informed, that transplanting of young rice plants was not practised. The sowing, therefore, must take place in rows of clumps, for it was in this form I saw it at harvest time. I know of no other country where the seasons and water supply allow of the rotation of wheat and rice crops on the same ground in one year; the wheat harvest being six weeks to two months earlier in Hufuf than in Iraq makes it possible. The flowering of the date-palms is also remarkably early here. I have seen two men carrying the male flowers in the last few days. The fat succulent underground stems of the *Tarthuth* are on sale in the bazaar every day. The badawin women bring them in, and the townspeople buy them freely and eat them raw.

[*February 5.*] Fahad ibn Jiluwi, the Governor's eldest

son, went off on a hawking expedition to the Rubia district, somewhere to the northward, because the grazing is plentiful there for the camels and they have expectations of finding Houbara and Gazelle.

I considered it desirable to get a list of the more important running springs of Hasa oasis. Many are so small that they only water one or two gardens. A list including all these would amount to a total of several hundreds, and it is doubtful whether any one man knows all their names; but the Revenue officials must have a record. According to my informant, the watering arrangements from the different springs are all in the hands of Shaikh Abdulla, that is, of Government. When a man buys a garden, he obtains a paper on which his times for watering are noted, and this paper is left with the Governor. If a man exceeds his time for taking water to the detriment of his neighbours, he is taken before the Governor and, if convicted, will be beaten. In consequence, water disputes are rare. At the same time the system of control that has been evolved by custom has now developed into a marvellously complicated and efficient piece of machinery. The list of springs and their location was given as follows :—

1. *Khadud*. Probably the biggest in the oasis; warm, but not so hot as Umm al Saba; waters the district of gardens from $1\frac{1}{2}$ miles east of Hufuf, where it rises, to the base of the Qara hills about eight miles east of the source. The spring issues from a large tubular opening in the rock into a pool. Much frequented by Hasa folk for bathing and washing clothes. Seen by me.

2. *Umm al Saba*. About as big as the Khadud, six miles north of Hufuf, three miles north of Mubarraz; waters depressions to all points of the compass, but its gardens do not join those of the springs nearer Hufuf. It rises from a circular fissure in chalky sandstone rock and flows into a basin from which seven separate streams

radiate, each one of which would be called a small river in England.

This was the hottest spring of the oasis. I took the temperature at the edge of the pool at 101° F., and estimated that, as the air was cool, it would have been 103° in the centre. Seen by me.

3. *Al Harra*. A strong flowing spring, smaller than the previous two; water tepid; rises half-mile north of Mubarraz town and waters a belt of gardens two or three miles away, running towards the east. The large basin is much used by men and women of Mubarraz for washing and bathing. Seen by me.

4. *Umm al Khorasan*. Smaller than Al Harra; temperature at edge of pool 88° F. on December 21; rises half-mile north of Hufuf and is surrounded by gardens which depend on it. Much used by Hufuf men and women for washing and bathing; there is a walled enclosure to shield the women from view (Plate 18). Seen by me.

5. *Barabar*. Fast flowing; rises north-east of Hufuf, and its gardens join those watered by the Khadud and Haqal. Its water is renowned for its good drinking qualities, and is always supplied to the Sultan when he is in Hufuf. Seen by me.

6. *Haqal*. Rises east of Hufuf, near the Khadud, and waters a district adjoining it. Not seen by me.

These six are the largest and most famous.

7. *Al Najm* is small and does not even flow, but is one of the most famous on account of its sulphurous water, which is supposed to cure fevers and other ailments. It is situated three miles north-west of Hufuf in a bare chalky sandstone plain. The water is said to come up boiling, but it was only tepid when I tested it. The pool is completely covered in with a masonry bath-house with two dressing-rooms, now falling into decay (Plate 22). There is also a water-lift that once irrigated about one acre of corn. Seen by me.

8. *Umm al Jamal*. A small flowing spring within 100 yards of the Khadud, of which it is probably an offshoot. Seen by me.

9. *Pariya*. Flowing spring, half-mile west of Hufuf. The most westerly spring in the oasis. Not seen by me.

10. *Benisim*. About half-mile north-west of Hufuf; helps to water the continuation of same palm-belt as *Pariya*. Not seen by me.

11. *Murjan*. Rises half-mile south of Mubarraz and waters a rectangular patch of palms about three-quarters mile wide and half-mile long. Not seen by me.

12. *Azawowi*. Small spring near Ain al Harra. Not seen by me.

13. *Jauhariya*. Rises in the direction of Umm al Saba. Not seen by me.

14. *Julaijila*. Said to be warm; rises to the north of Umm al Saba. Not seen by me.

15. *Wajaj*. Near the Oqair road, that is, east of Hufuf. Not seen by me.

The Salaisil is a fast-running river in the midst of the eastern palm-belt. Probably it is a conduit conveying waters from other springs, for I could hear of no spring of that name. Not seen by me.

Mutaifi, pronounced Ntaifi, according to my informant is a village, the gardens of which are irrigated by Hugaiji, a small spring near Umm al Saba, that is, north of Hufuf. Not seen by me.

Battaliya is a village which drinks from the Jauhariya spring, about six miles north of Hufuf. Not seen by me.

[February 6.] Bright sunny morning with cool north-west wind, just sufficient to stir the ends of the palm-fronds.

The price of an egg in the bazaar is three tawila; a chicken, 100 tawila; matches, one tawila a box; a good fat sheep, ten to eleven riyals, down to four riyals for a thin one. Lucerne is three to four tawila the *aquba*. An

aquba is measured as it is cut and laid out in the gardens, and represents the amount gathered up from the elbow to the finger-tips, literally an armful. It is as vague as the rest of their measures. A camel will eat thirty to forty *aquba* and a donkey fifteen *aquba* per day. The *aquba* is packed tight for bringing into the market, and in this condition I could just encircle the bunch with my two thumbs and forefingers. Donkeys require dates in addition to the lucerne ration above.

The falconer's call to hawks is exactly like the Englishman's "Tally-ho," and can be heard a long distance. It is a very familiar sound in Hufuf, as the men are always training hawks, and often one escapes and goes off with a long line attached to the jesses or small leather straps attached to the legs. Then the yells are heard in all quarters, and there is a general stampede to see in which direction the fugitive is making, and a frantic swinging of the lure—a bird's wings and feathers tied to a string and used to entice the bird down, as it is accustomed to find a piece of meat among the feathers.

[February 7.] I got up this morning feeling none too fit, with a tendency to be giddy, so took a big teaspoonful of Eno's Fruit Salt in warm water, hoping it was only liver, and sent the midday meal away untouched for the first time. It seemed the coldest morning we had had. In the house it was only just warm enough with an *aba*, or Arab cloak, over my Norfolk jacket, and in the afternoon I had to sit in the sun under the south wall, sheltering from a breath of north wind that was distinctly chilly; four blankets and the valise strapped up were barely sufficient to keep me warm. I did not require a fire throughout the winter, but was offered a charcoal brazier on one of the colder mornings.

We went to Qusaibi's window for the market, and the Sultan arrived unexpectedly, for he was fasting, and it was not considered likely that he would appear in public. Instead of going into the big room with his father and the

crowd, Faisal elected to come and sit at the window at the far end of the veranda in which I was sitting. We exchanged smiles from a distance, and he settled himself down to look out of the window with one or two of his father's Court, and made no sign of wishing to speak to me. I was placed in a difficult position, not knowing quite what was required of me. Muhammad Hasan was quite hopeless on these occasions. First he said, "Go and talk to him," and then said, "Perhaps it would be better not to." Finally, I went forward to the alcove to say "How do you do?" and see what happened. The boy got up and shook hands, and motioned me to a chair beside him, but an old man with a chestnut beard said, "The Shaikh of Shaikhs (the Sultan) is here," meaning, I supposed, that as he was in the next room, it would not be considered correct to be seen talking to his son. So, making an excuse that I wanted to take a photograph, I retired to my corner. Then arose the question, Ought I to propose going in to see the Sultan, or wait to be sent for? It was possible he had private business with the Qusaibis and would not want to be disturbed. Muhammad Hasan had by now quite lost his head and, after much discussion and many decisions to go and not to go, I finally sent him off to ask. He soon returned with a welcome.

The Sultan received me with his usual smile and seated me next to him. He was apparently seeking diversion from the dull round of duty at home and was toying as before with some books that were on the table. He said he hoped the camels would be in before long, and informed me that the Labour Party had taken over the Government from the Conservatives in London. But one more tense moment was in store for me. Coffee came, and I took a cup, still thinking of the political situation in England, and was just about to drink when I realised suddenly that I had not only taken a cup before the Sultan, but was about to drink before him as well. He at once saw the position and what was passing in my mind, and put me at ease, with a

suspicion of a smile, saying, "It's all right. I am fasting." As soon as the censer had passed round, I made an excuse and returned to my house.

The solicitude of my attendants now that they knew I was not well was very touching. All kinds of sympathy were shown by little acts and constant inquiries. My sending the meal away untouched convinced them that a serious breakdown was imminent. Death alone would prevent an Arab from attacking a meal. I took a peg of brandy in the evening and turned in early.

CHAPTER XIII

PREPARATIONS FOR THE JOURNEY TO THE SOUTH

[*February 8.*] I felt better, which was a relief, as preparations were commencing for the expedition. A message came to ask what food would be required for the journey. I replied that we would eat only as the badawin do. They would probably make better arrangements if they were not harassed by special requirements, and the instruments and kit would take up a large share of the camel transport available. It was very encouraging to hear that both Muhammad Hasan and Abu Saud, the two soldiers, were under orders to accompany me. We were used to each other, and breaking in another recruit would have wasted valuable time on the road. They were preparing to be away about a month. On a trip of this kind it is difficult to estimate the number of cartridges likely to be needed. We didn't want to take an ounce too much, yet it would be disastrous to run short; there was nothing to guide one as to the number of birds that might be seen on waterless marches, and the oasis of Jabrin might be teeming with bird life. For the twelve-bore gun for collecting only, we took 75 No. 7 shot and 75 dust, allowing five cartridges a day for the month, besides 50 of No. 4 shot, which could be used for game, if there were any, as well as for collecting, and 70 cartridges for the .410 gun, although little use for this small weapon was anticipated. When we returned, only six of the .410 cartridges had been used. In bare desert country even the small birds do not give close shots, and the small-shot twelve-bore cartridges have to be used. We also found birds to be so scarce that five

cartridges a day was more than enough, and many were brought back.

For the camera, rolls of twelve films had the preference over sixes, in view of the advantage of reducing the number of times when it is necessary to change films. Sand gets into the camera every time it is opened. It is necessary to stop the camel and dismount, as the operation cannot satisfactorily be performed on the move. The advantage was all on the side of twelve-film rolls; but I thought it well to take a few sixes, for when an opportunity occurred of sending a box of specimens home, a six-film roll could be finished off more quickly and forwarded with them. Another question the traveller has to decide is whether to risk sending films home and having them developed there as soon as possible, or to keep them and take them home with him. I despatched mine as soon as possible, and was lucky in losing none. Those I brought home, which remained undeveloped the longer time, showed signs of deterioration although no more than four months elapsed between the taking of the photograph and the developing.

When we had finished, the kit totalled nine packages. The theodolite-box, which also contained the other instruments, was long and unwieldy, as it had to take the legs, which even when folded made it a difficult package to tie on a camel. In consequence, although needing the most delicate handling of any, it took on the functions of a battering-ram as soon as the caravan moved. The hurricane lamp had also to travel in a box, for, if tied on and allowed to swing, it is broken at the first collision between two camels. Another box contained traps, an earthenware jar with a wide mouth for reptiles, and a two-gallon petrol tin with screw stopper, containing a gallon of pure methylated spirit. The system we followed, which worked well, was to put the Lizards into spirit in a tin for two hours at the night's camp. They were then labelled with ordinary pencil, which does not run or

fade in spirit, tied in a wrap of cotton-wool soaked in methylated, and placed in the jar, while the surplus spirit was poured back into the petrol-tin and screwed down. In this way no spirit was lost by leakage, and all my specimens arrived in first-rate condition. Another invaluable package was a tin-lined venesta box with trays with bottoms of sacking to take large and small birds. Wrapped up in cotton-wool, and with the empty parts of the trays filled with wool, the specimens could be packed partly dry and retained a good shape in spite of the eternal jolting and swaying of the camels. Mammals were pinned out on a board and thus packed in the trays, but this method could be improved upon by having a tray with a cork-lined wooden bottom on which the mammals could be pinned out to dry without having to be touched again, while the tray could be taken out and placed in the air when a halt of two days or more gave an opportunity. There was a tin deed-box with diaries, pencils, etc., a leather *yakdan* for clothes, and my Wolseley valise; while Mehdi had a roll of bedding and a small box.

We estimated that all this would be loaded on two camels. In addition, there were a cooking-pot, a sack of flour, two palm-leaf baskets of dates, about 80 lbs. in each, four water-skins of an entire goat, a bag of rice, about 80 lbs., a tin of *dihin*, or fat, used in cooking and melted in plain boiled rice for the evening meal, and a tent for me, made of English canvas, but on an Arab pattern, that is, open on one side. Then there were the soldiers' small kits. The *dhalul*, or riding camel, is not subjected to the indignity of being loaded with baggage, beyond two capacious saddle-bags carrying guns, cartridges and small trifles that do not spoil its contours, whereas the loaded baggage camel looks like a moving warehouse. Four *dhaluls* and three other camels for baggage were decided on, seven in all, and the party comprised, besides myself and Mehdi, two

soldiers, one guide, or *rafk*, of the Al Murra tribe, Saleh by name (Plates 27 and 48), who knew the way and was a cousin of the Shaikh, Hamad ibn Maradvath, Paramount Tribal Shaikh of the Jabir branch of the Al Murra, and recently appointed by the Sultan Amir of Jabrin, and my prospective host there; one other man, Khalid, a Qahtani or one of the Qatan tribe, was included to help with the loads and camels; altogether we were six. Muhammad Hasan was in charge (Plates 42 and 48). Although he was a boy of not much over twenty, I had great confidence in him, and apparently the Governor shared my view. Muhammad related a conversation he overheard when he was paraded before the Sultan to receive instructions. The Sultan turned to the Governor and said: "You are never going to send this inexperienced boy on this mission?" And the Governor replied, "Send one of your men if you like, but I know my own men and you do not." Abu Saud, the other soldier, was cook, coffee-maker and jester to the expedition. All four natives carried rifles, while Mehdi and I went unarmed except for the two sporting guns. As will be seen, we had not gone far before we had to send back for four more camels, which made up the total to eleven animals, and the two tribesmen who came with them completed the party of eight men who did the journey to Jabrin.

[February 9.] A day packed with incident. The men were early at work on the water-skins, which were lying about the courtyard filled with water and looking like a row of slaughtered hairless goats. Many were found to leak and had to be exchanged until the required number of four was made up. To my surprise Dr. Abdulla, or Abdulla Effendi, the Sultan's representative at the Kuwait Conference, was announced. He had left me on December 3, it will be remembered, on his way to the Conference, and in the meantime had also journeyed to Baghdad, and thence to Bahrain, where he had been

nearly killed by a friend who had given him a ride in his motor-car and had overturned it. He was still very lame from the effects. He had reached Hufuf the previous evening, and I afterwards heard that my camels, which had come in from the grazing some seven days previously, had been switched off to meet him, and that this, with the delay caused by his accident, was the explanation of my long wait for transport. This morning he had a very serious expression and delivered a message from the Sultan to the effect that everything had been ready for my departure, when a message had come in from Jabrin that very day to say that the Awamir tribe, who had been raiding in that neighbourhood, had cut off a party of the Al Murra, killed ten families, and taken their camels. He thought it would be better to cancel the journey even at this stage. It is difficult to describe my disappointment at this moment. If the Sultan had made up his mind, there was an end of the matter, and I had waited and planned in vain.

Abdulla went on to explain that the Awamir and Saiar were tribes that roam the desert behind Jabal Akhdhar in Oman. They owe a vague allegiance to the Sultan of Muscat, but are so inaccessible that he has no control over them. He then drew in my note-book a sketch map, which, although rough, was well oriented and gave a good idea of the areas of these two tribes in relation to that of the Al Murra. To the Awamir he ascribed the desert bounded on the north-west by the Jabrin desert of the Al Murra; to the north were the Batin, occupying, in the hinterland between the Trucial Oman and Oman Proper coasts, a district I can only identify with Batina, or Batinah, on the present maps. To the south of the Awamir he placed the Saiar lands and south of them the Ahqaf, a name given to the Sand desert bordering on the Hadhramaut, and often intended to imply the whole southern portion of the Great South Desert.

Abdulla's map indicated no boundary between the Al



26. JAHAD, THE WADI DAWASIR TRIBESMAN.



27. SALEH, THE AL MURRA GUIDE.

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Murra country and that of the Awamir, but the intervening space was ornamented with two arrows, one coming from each name with the point directed towards the other. This is so apt a method of indicating a tribal boundary between Arab border tribes in a featureless desert that I can think of no improvement on it. The situation at the time in Jabrin was that the majority of the tribes were away on their northern grazings, near Juda, some two hundred miles from the central oasis. Raiding parties from their natural enemies were taking the opportunity to prowl around Jabrin, to cut off any small parties that they could outnumber and relieve of their camels. In the early summer, when the grazing in Jabrin supports them, the hordes of Al Murra return, doubtless spread over the desert to the south, and are then strong enough to return the winter calls of their neighbours by invading the Awamir territories, though this side of the ceremony was discreetly left unmentioned. The enmity between the two is acute, and reprisals are carried out by slaughtering the prisoners on either side.

Having explained all this, Abdulla Effendi went on to the second part of the message, and gave me the account of Captain Shakespear's death in 1915, which, he said, was even to-day a grief and a painful memory to the Sultan. The story was a great tribute to Shakespear's courage, for it told how, when temporary panic seized the armies of Ibn Saud, he refused to fly with them before the onrush of the victorious camel-riders of the Amir of Hail, and simply saying, "Englishmen do not run away," faced the charge, wounded, deserted and alone, while his erstwhile companions in arms disappeared over the horizon. Abdulla pointed out that an Englishman's bravery was a source of embarrassment, and it was entirely for this reason that he wished to cancel the journey. Running away was part of the game in badawin warfare, unless odds of position and numbers were in one's favour. I promised Abdulla to run like two hares

at the first sight of a *gom* or raiding party, and explained that my position was different from that of Captain Shakespear or any of the Political Officers, as I was not there in an official capacity, and the Sultan would in no way be held responsible. I then asked whether this explanation would satisfy the Sultan. Abdulla did not think it would, still, when I suggested writing a note which could be shown in the event of my being killed, and would absolve the Sultan of all blame, he said he would take it round to the Palace and use his persuasive powers on my behalf. We then concocted the following document :

“*Hufuf, February 8.*—I want to travel to Jabrin, and His Highness the Sultan of Najd has kindly warned me of the possible danger of meeting raiding parties from the ‘South.’ If any accident should happen I take full responsibility.”

It was written in English, but I translated it. After I had signed the fair copy, I spent an anxious half-hour till Abdulla returned and said, “It’s all right. Get your things packed and be off.”

No time was lost, and such was my haste to get out of the town lest the Sultan should change his mind that it was not till I was mounting my camel at midday that I remembered I had not said good-bye to him. Muhammad Hasan, although a broken reed in matters of etiquette, was consulted, and said it would mean another two hours’ delay, as there would be no chance of an interview until after the midday prayers. “Besides,” he added, “you will see him on your return, and it is rumoured you will travel with him to Riyadh when we get back.” This decided me to leave without risking further delay, and make apologies later on. There was another wait while we procured a four-gallon tin of paraffin in the bazaar for my lamp. I carried two pint bottles full in the lamp-box, but after much discussion the men decided that a tin should be purchased as we passed through. It was

suspended swinging to the already bulging loads, and the narrow streets resounded as it banged against the houses to the accompaniment of the cannonade from my other boxes. There is nothing so damaging to the temper, and I was relieved when at length we passed the South Gate.

The camel is not easy to control in the desert except on the rare occasions when you and your mount desire to go exactly the same way. In a town a tap on the neck with the camel-stick has little effect, and mine made the most of its time while we waited in the bazaar by looting bunches of lucerne from the baskets carried on people's heads and chewing hard to place as much as possible beyond recall before the bunch was snatched away by the indignant owner.

CHAPTER XIV

INTO THE GREAT SOUTH DESERT

THE paraffin tin was leaking badly, a dark trail being visible on the sand. It seemed a hopeless task to try to stop it, but the resources of the desert are as varied as unexpected. The men took a small wad of dates and stuck it over the hole, drying up the damp surface with fine sand. This became an impenetrable pad and served the purpose well to the journey's end. There was sufficient wind to raise a sandstorm, and although I knew we were making for a point called Dalaiqiya near Jabal Arba, no landmarks were visible, and the problem of taking bearings was simplified, as there was nothing to see. The general direction of the course was taken with the compass about every quarter of an hour. Around us lay a bushy plain behind which the square castle-like cliffs of Jabal Arba appeared through the mist when we got within three miles. Dalaiqiya is a fortified and lonely house or *Qasr* with mud walls and a well of good water at twenty feet. The tenant was a negro with wife and children, probably a slave pensioner of the Sultan. He had a small garden with about twenty young date trees, brinjals and lucerne, and there was a flourishing patch of about four acres of wheat lying outside the garden wall, watered by a lift. We camped outside the garden wall, although only twelve miles from Hufuf; this is considered enough for the first day. The sandstorm stopped towards evening, and I was able to get back-bearings to the familiar hills north of Hufuf. I also got the bearings of hills on the southern horizon near which we should pass on the morrow, and laid the



28. JABAL ARBA, HUFUF, THE HIGH CLIFFS FACING
WEST



29. CHALKY SANDSTONE CLIFFS, JABAL ABU GHANIMA, HUFUF.

foundation of the new map with an accuracy that would have been impossible had the sandstorm continued. Jabal Arba is higher than the other hills of Hufuf oasis. It seems to be composed of a softer chalky sandstone, so that decay has been more rapid, leaving several hard cores to form precipitous walls and gigantic pillars (Plate 28). To the south are four round hummocks in line in the distance, making a remarkable row and giving rise to the Arabic name Jabal Arba (four hills).

In the evening I was able to make the better acquaintance of our guide Saleh (Plates 27 and 48). He called himself a Murri, that is, a member of the Al Murra tribe, and was the owner of a date-garden in Jabrin. Having established himself as being well-connected by his kinship to the Amir of Jabrin, he next wished to show that in spite of his rich relations he was not above receiving some little recognition for his services, and embarked on a long story of which the theme was that his wardrobe consisted of the one shirt he was wearing and a thin *aba*. He was also disturbed in his mind because, in calculating the number of camels, a *dhalul* for his especial use had been omitted, and he had to jump up behind our saddles for an occasional lift.

Mehdi's eyes got inflamed and painful from the wind and sand. It was a difficult complaint to treat on the trek, and it made the skinning of the specimens difficult in the evenings. I could only bathe the eyes with warm water and hope for the best. After dark another party of camels came out of the night into the glare of the camp fire. A Shaikh of Qatar, Muhammad ibn Thani, and his two servants, on the way from Hufuf to Qatar after an audience with the Sultan, bought some lucerne for their camels at the garden and camped near us. Next morning they started direct for Salwa and would cross the base of the Qatar promontory to Doha.¹

¹ Owing to an oversight this route was marked from Zarnuqa well in a map published in the *Geographical Journal*.

The Southern Cross came up after midnight and went down again before dawn. All four stars were plainly visible, the bottom one being not much above the horizon; the air is so clear that stars are to be seen the moment they rise. Scorpio was also a wonderful constellation here, the whole of the series being well up in the sky.

[February 10.] We were all packed up an hour after sunrise and left Dalaiqiya, our objective being Ain Zarnuqa, a well in the sand-dunes to the south-east of Jabal Kharma Zarnuqa, a range of hills we could see lying to our south. So far our road had been firm chalky sandstone plain on which even heavy cars could travel, but within an hour of starting we passed several belts of steep bush-covered sand-dunes, thirty feet high, over which no wheeled transport could have made progress, although a harder surface might have been found by going east or west of the direct line. The camels were allowed to graze as they walked, for some of the bushes that looked as dead as hay below were throwing up an array of young green shoots. The animals seemed to revel in these and stretched out their necks to tear off large mouthfuls as they passed. One of their favourite bushes was the remarkable *Aabel* (*Calligonum comosum*) (Plate 35). The small round catkins vary from red or rosy pink to yellow, and are the size of grapes. The small female flowers usually grow on separate stems. One bush had clusters of big, brown, hairy caterpillars feeding on the tender shoots.

After three hours' march we stopped for half an hour while the coffee-pot was boiled, and I took some hasty bearings on hill points that I recognised and had already passed, and on others that were coming into view, which I hoped would be sufficiently conspicuous to be recognised later from another aspect. It is a familiar experience to take a lot of readings on points that appear dominant features of the landscape from the north, and then to find that they become absorbed in their surroundings and are

quite impossible to recognise again when you get to the south of them an hour or two afterwards. We left the Kharma Zarnuqa range a mile to our westward, and found travelling good on level gravel stretches alternating with flat sand, until we reached the southern bluffs of the hills and turned eastward through some lofty dunes of soft sand, to find the single well Zarnuqa, the most southerly water in the Hasa Province, nestling in a hollow with dunes some sixty to eighty feet high towering all round. This is part of the large sand-dune tract that runs north-westward to the forty miles of dunes we had crossed between Oqair and Hufuf, and is continuous with the great Jafura desert lying to our southward. These facts were gradually being revealed as we progressed. The maps of this region were almost blank, and the little detail there was had been supplied from native information and was often very misleading; anything marked was either far out of its correct position or did not exist at all. The task of fitting in my preconceived idea of the country with Saleh's description of what lay in front of us was a Chinese puzzle. He always spoke of Yabrin, never of Jabrin, and it was my intention to use that form until it was pointed out that even an educated Arab pronounces the word Yabrin but always writes it with a J. At this stage it seemed certain that the wells mentioned by Philby as lying in the channel of the Wadi Sahba on the way between Hufuf and Jabrin were myths. We should have used them, but Saleh said that after leaving Zarnuqa we should not see wells until we entered Jabrin, and he considered six days' hard travelling would cover the distance.

Our march over the waterless country was carried out on much the same system throughout. We got away as soon after dawn as possible, usually at sunrise; after two hours a halt of half an hour was made for coffee, and this was followed by six hours' marching, usually rather a tiring effort, as it included the hottest hours of

the day. Another half-hour spell was occupied in making and drinking coffee, and we stopped for the night about an hour before sunset. The tent was erected, and rice was boiled for the evening meal after a preliminary round of tea and coffee to revive our spirits. Camels were driven out by one of the men to graze for two or three hours. I took care to make my arrangements for collecting subordinate to those of travel, as I knew the men were anxious until we got once again within reasonable distance of water. When we reached wells this concession was withdrawn.

We were not long in hearing from Saleh what a wonderful place Jabrin was. He said it had running springs like Hufuf, and he even advised me not to waste cartridges on a few Wheatears and Larks he saw me shoot, for all we had would be required in Jabrin. These glowing accounts continued daily until we actually arrived at the place and were utterly disillusioned. Such is the pride of the badawin in the miserable country he calls home, that he can sing its praises with every circumstance of exaggeration and misstatement, though he well knows his untruths must be exposed in a day or even in an hour.

We passed an unusual lot of dragon-flies during the day's march, flying south to north. They must travel long distances in migration, as they were coming from the waterless interior, and even if some of them had bred in the water of Jabrin they had come over 150 miles of desert. Since we met them on most days it seemed that some must have started from the far South or the Red Sea side of the peninsula.

A miserable Arab and his camel were at the Zarnuqa well when we arrived, replenishing water-skins. He said there was an isolation camp of camels suffering from *jarab* somewhere out in the blue, and he had come in to take out water for the men. I noticed that our beasts were not allowed near the well until he and his infected

beast were well over the horizon. They were not thirsty, although they had had no drink for two days; two gallons each seemed to satisfy them. The water was twenty feet down the well, and was pulled up by a bucket and rope and cast into a trough of old camel-bones, on which framework each party spread its own goat-skin to hold the water, also providing its own bucket and rope. The well-shaft was circular and sunk in sandstone rock of which there were outcrops in the trough of the dunes here and there. The mouth was uncovered, but protected by stout branches of desert bush, so that only a minimum of blowing sand should find its way in. Nevertheless, high moving dunes surrounded the well, and it was clearly only a matter of time before one of them would advance and smother it. I asked whose business it would be to attend to it then. Like everything else, it was a matter for the Governor, on whose orders the then Shaikh of one of the tribes would supply the men, and they would get an iron pick and cut out another well in advance of the dune or behind it; that is, in the next trough. The water was good, but of a decidedly yellow tint. As the sun went down, the gentle breeze which had been blowing from the south was overpowered by a twenty-mile-an-hour gale from the north, which flung up the sand and threatened to blow down the tent. We could hear the approaching wind sighing across the dunes long before it arrived.

[*February 11.*] The wind had dropped during the night, and there was a very heavy dew in the morning. The dew not only soaked our kit in and outside the tent, but saturated the sand to a depth of half an inch, so that Mehdi was deceived into thinking it had been raining. There was not a cloud in the sky and no mist; what little breeze there was came from the north. These dews play a very important part in the life of the rainless or nearly rainless deserts, and I made careful notes whenever they occurred. The plants and animals and

insects are entirely dependent on them for their existence, and it is only those specially adapted for this scanty supply of moisture that can survive as residents (See Chapter XIX).

The camels were all loaded, and I had mounted, when Saleh, the guide, declared that in his opinion our camels were too tired to face the six days' waterless march, burdened as they were and with none in reserve in case one fell out. A consultation took place between him and Muhammad Hasan, and it was decided that Saleh should hasten back to Hufuf as fast as possible to bring three more. It was probably no subterfuge of any kind, as they said that the blame lay with the authorities, who, instead of giving us the camels when they came fresh from the northern pastures, had rushed them off to Oqair to fetch Abdulla Effendi simply because they were nearest to hand. There was no grazing on the Oqair road or at Oqair itself while they were waiting, and both journeys through the dunes had doubtless been done at top speed. In consequence, we were handed over cattle that were tired and stale before they started, and the men thought the Sultan would realise this. We read of such wonderful stories of the endurance of the camel that it is important to see, as in this instance, that it is not unlimited, and that the Arab is far from treating the beasts as machines of perpetual motion. What little foresight he possesses is more often exerted in the interests of his camel than in his own, and had our track from Jabrin been dotted with corpses our leader would have earned a bad mark as a camel-master, however spectacular the performance might have been. Cases of urgency, such as battle or flight or despatch work, are, of course, viewed from a different standpoint.

During the mounting we had an exhibition of one of the rare examples that I saw of resentment on the part of a camel towards his master. No sooner had Mèhdi mounted than his beast trotted about roaring loudly, and

repeatedly turned its head and open jaws round towards its rider's feet in such a threatening manner that Mehdi was kept busy trying to place them out of its reach, not an easy matter to accomplish. The comedy was cut short by the camel's sitting down with such suddenness that, but for his hold on the pommel, the boy would have been thrown into the sands. He skipped clear with much agility, and two men ran forward and removed the saddle, explaining that this was merely a protest against a faulty fold made in the cloth when the saddle was put on; either it pinched or it must have rubbed a gall. Even in this case there seemed no intent to bite, for the camel could easily have done so had it wished. After the rearrangement of the offending saddle-pad it moved off without a murmur.

We all had to dismount and wait until Saleh's return. He took my camel, as being the fastest, and trotted off on his errand. The tent was re-erected, and I availed myself of the opportunity of getting the latitude and longitude of the well by the altitude of the sun east of the meridian, on the meridian, and again west of the meridian, which would prove valuable in correcting my compass work for the map. By walking to the highest sand-dune, it was possible to recognise the faint outline of Jabal Arba in the north, and get a bearing on this as well as on the northern and southern points of Jabal Kharma Zarnuqa. This is a sandstone range, a broad system of hills about four miles wide north and south, the outline of which was previously, of course, unmapped.

Our meal at midday consisted of *Hanani*, a mixture of pounded wheat boiled and served with sugar and fat. I intended to eat with the party while on the march, but the men would not hear of it, and my portion was brought into the tent. Occasionally, as a matter of form, Muhammad Hasan came in as the host and ate a little politely, but he joined the others to feed. Abu Saud told me again that he once went with a party of soldiers sent by

the Governor to the hinterland of Oman, and they returned via Jabrin to water the camels. As it was probably a raid or counter-raid on the Awamir, he was not very voluble on the subject, but he said it took them thirty-six days' quick marching from Hufuf to Oman.

I picked up and examined one of the soldier's rifles, an old pattern of '303 Lee-Enfield, with "Faisal" inscribed in Arabic on the metal. I asked no questions about its origin, but should surmise it was part of the loot from a skirmish on the Hejaz border. The camels were out all day grazing, which was what they really needed. On their return at sunset to be couched in the camp, Khalid, who had been with them, brought me a Skink that he had caught in the sands. It was a stout lizard with short limbs of a pale creamy-white and a shiny skin, and on the side were dark red streaks that looked like patches of congealed blood. The head and snout, shaped like a chisel, and the stream-line form of the rest of the body, leave little doubt that it has been developed to pass much of its time in forcing its way under loose sand. A few days later I saw Saleh catch one; its track was plainly visible along the soft, steep, leeward side of a high sand-dune, although the sand is so unstable that the footprints are magnified and might be mistaken for those of a much larger animal. Where the track ceases there is a circle, which shows where the lizard has dived head-first into the sand. The badawin know this and thrust their hand and arm into the sand for about eighteen inches, and seldom fail to bring out the wriggling reptile. Their intimate knowledge of the whereabouts of this beast leads me to think it is the lizard that is exported to India from Hasa at remunerative prices and sold there—in Karachi, for instance—for medical purposes; it is supposed to have certain healing virtues, but I did not make certain of the exact species to which they referred.

The Zarnuqa well is the base of the Al Murra when their camels are grazing the Jafura desert. There was



30 SARAMID GRAVEL PLAIN AND "ALTAT" BUSHES



31 MUHDI AND TWO SOLDIERS BREASTING A SAND DUNE IN THE FELTH OF A SAND-STORM, JAFURA DESERT

evidence of the vast hordes that had congregated round about it during recent years, and we found the camel-ticks numerous. They were in the active stage, that is, before they get distended with blood. They do not, of course, attack human beings, and were doubtless reserving their energies for the spring migration of the Al Murra camels. There were some large black ants that carried their tails very high and ran about as if they were looking for trouble. Nest-building in loose sand must be a tiresome duty even to an ant, considering that the roof must always be falling in. I was also able to test the intelligence of a Scarab Beetle that came through the camp pushing her golf-ball of camel refuse, like Sisypheus of old rolling his stone up the hill. She wanted to find a piece of sand sufficiently firm to stand excavation. Having made a tunnel, she would lay an egg in it, then roll the ball in and leave it for the grub to feed on when it hatched; but the sand was all too loose to suit her purpose. She progressed backwards, propelling herself with the two front legs, using the hind legs to kick the ball along, while she was actually standing on her head as she marched. When her ball got wedged under our boxes she let go, got behind it, pushed it out, and started afresh, maintaining, in spite of the many obstacles in the camp, a general direction which was constant. I threw some sand at her, and she feigned death for five minutes and then went on again. Every five yards she left the ball and made a test excavation. At first the sand was scratched out under her and kicked away behind; when this little heap got in the way she turned round and, getting her shovel-shaped head under it, pushed it in front of her out of the way. This left a little pile of sand on her head, obstructing the eyes and antennæ, which was quickly removed with the front leg acting as a brush. But all the holes she made fell in during the early stages, and the ball-pushing was resumed. I timed the rate of progress and measured the distance; in half an hour she

had gone eighty-five yards. When she was busy with one hole I moved the ball one yard to the windward. She went straight to the place where she herself had left it and ran round in ever-increasing circles until she got directly to leeward, then walked straight to it. The next time I placed the ball two paces to the leeward of her, to test her powers of hunting by scent, as this seemed to be her guide. On missing her property, she made one or two small circles and then a most businesslike cast in a very large circle that was only half completed when she came directly to leeward of the ball, and turned and walked straight to it.

We were visited by few birds. A Raven was flying round the camp, but did not give me a chance. I could recognise the brown of the neck through field-glasses and so knew it for the Desert or Brown-necked Raven (*Corvus corax ruficollis*); but these birds would be difficult to distinguish from their neighbours of Iraq (*C. c. laurencii*). The latter's stouter bill might be noticed, but again the longer narrower bill of *ruficollis* might easily be mistaken for that of a Rook, and there is little difference in the size of the birds.

We had an example of primitive surgery last night. Saleh had run a thorn deep into the sole of his foot. He sat in the firelight to pull it out, and then, taking a glowing red ember from the blaze, proceeded to cauterise the wound. The men were also adopting the ways of the desert, and I saw one of them washing under a staling camel.

[February 12.] No sign of Saleh and the camels. He quite expected to be back last evening, although the most optimistic estimate made it impossible that he could do it in the time.

A wonderful scene is the dawn in these desert camps. The first man to wake goes out to start the fire, for which a reserve of sticks and scrub has been collected the night before. The flickering flames then throw flashes on to

the tent and silhouette the big beaked coffee-pots and the row of camel-saddles placed to shield the embers from the breeze. Then shrouded figures with cloaks thrown over their heads begin to congregate, crouching round the hearth to warm their hands. The *Adthan* follows—the Qahtani said it this morning in his broad badawin tongue—and they all line up and pray. Behind this group lie the camels, all folded up with outstretched necks; occasionally the sound of their jaws chewing the cud is wafted across. The background is the dark outline of the scrub-dotted sand-dunes, and over all stretches the sky with a few small clouds catching the first rays of light.

The camp was well supplied with fuel as, in addition to the abundant scrub on the dunes, which burns well when green, there was plenty of camel refuse, much to be preferred in a high wind, since it merely glows the brighter in a draught, while the sparks from wood fires blow about everywhere.

The badawin language is very different from Arabic, and I had much difficulty in understanding it; in order to get an explanation of a difficult point I had to ask Mehdi to translate it into ordinary Arabic. He used to have lessons at night over the camp fire, and I could hear shouts of laughter over his blunders. The task seemed to be chiefly the repetition of endless lines of badawin poetry, recited with an attractive rhythm in a sing-song voice. Such poetry has been handed down from time immemorial and has never been put into writing. It is customary for the listener to repeat the last word of the lines in an appreciative voice to show that he is interested, or perhaps even awake, for some of the poems are very long.

About midday Saleh arrived with the reinforcements, three more baggage camels with two more badawin, one a Dausari, or a nomad from Wadi Dawasir, named Jahad (Plate 26), a good-looking boy, who had recently become an Ikhwan, and his companion, a half-bred negro

of limited intelligence. Saleh had taken the opportunity of squeezing a camel for himself out of the Governor during the sensation caused by his arrival in Hufuf. Apparently the Sultan had sent for him at once and asked whether I had been left in the waterless desert; he was relieved to learn that we were comfortably settled beside the well.

We all started in excellent spirits. The loads were rearranged, and, as usual during the first few hours, there were many stoppages to adjust those that were slipping. I even heard the theodolite-box go right over on a sand-dune with a crash, but my nerves were becoming hardened and the spirit of fatalism was inducing a certain callousness.

A sandstorm was blowing at noon when we left, the wind being in the north. It was not so unpleasant on our southerly course as it would be to anyone meeting it. The prevailing wind was evidently north, as the dunes were steep and soft to the south, hard and gradually sloping on the north; and the moving dunes in that case would be advancing towards the south. The bushes seemed to have a firm hold on the dunes in the interior of the sandy waste and would tend to retard their progress. It seemed probable that these dunes were the direct result of the decay of the chalky sandstone of the hills, Kharma Zarnuqa, which has a high percentage of sand.

We emerged from the sands after about three miles and entered a flat gravel plain that made travelling much more comfortable and speedy. A camel cannot resist trotting when descending the side of each sandhill, and it was this little jog-trot that caused most of the casualties among the kit. On the plain, which extended westward as far as the eye could see, there was nothing to stop a motor-car from going at sixty miles an hour, and the surface was hard enough to carry heavy lorries. We were making for a hill, Jabal Buruj al Majarib, standing 150

feet above the plain to our south and about half a mile long. As its bearing had already been taken from Zarnuqa well, I was saved a lot of compass work on the road; but it was evident that these sandstone hills were getting smaller as we moved southward, and that when we eventually left them behind there would be no landmarks. It was like setting out to sea and losing sight of land, when your compass is the only guide. In this case our pilot Saleh was taking us to Jabrin, and there was no doubt of his ability to do so; I was determined that he should lay out the course as he liked without interference or suggestions from anybody. Nevertheless, I wanted not only to get safely to Jabrin and back, but also to mark the place correctly on the map, and the jolting of the theodolite-box reminded me of the possibility of finding the instrument damaged when the time came to use it as a means of getting that position from the stars. The break in the continuity of the hills would leave me without any chance of linking Jabrin to Hufuf except by an estimate of the general bearing of our line of march, which, even although taken repeatedly, might be many miles out in a distance of 150 miles. The next range on our line, another small hog's-back group, was Jabal Huwaitiya, valuable enough inasmuch as it was visible from Jabal Buruj al Majarib.

Saleh rode beside me, and I encouraged him to talk about his country. He was a little embarrassed when he saw I was writing down what he said as we marched along; but he got used to this after a day or two. As all the names of places were entirely new, and many of them did not resemble place-names in any other part of Arabia or Iraq, it was necessary to write them down at once. Whenever the soldiers drifted away out of hearing, Saleh took the opportunity to ingratiate himself with me in the way best known to him; but he had much more success in this direction when he began to show me the ways of desert creatures and help to collect specimens.

The conversation now ran in this vein. He related how when he returned to Hufuf his friends asked him what I was like, and he said, "Sahib is a very good fellow. He is like a Shaikh and eats by himself"; then, thinking perhaps Mehdi might be the agent for distributing largesse, he added, in his hearing, "And Mehdi is a good fellow too and eats with us." It was all amusingly simple and palpable. I cut short his eulogy in order to find out his idea of the Wadi Sahba, which we are to cross in a few days and which I shall be the first European to see. He said it entered the sea south of Salwa. He also said there was a direct way of reaching Riyadh from Jabrin through Summan to the Dahana, through the Dahana into Wadi Sahba, and thence to Kharj. Between Kharj and Jabrin the country was waterless, and the journey between Riyadh and Jabrin he estimated at eight days. By linking this information with that obtained further north on the direct Hufuf-Riyadh track, we are able to form some idea of the unknown region, particularly of the Dahana sand-dune tract and the Summan gravel plain; and the character of the former, the continuous sand joining the Nafud desert between Jauf al Amir and Hail in the north to the Great South¹ Desert, the Al Rimal (or Ruba al Khali of ancient writers), has at last been established. In a burst of confidence, Saleh next mentioned a ruined castle in Jabrin that contained hidden gold, and promised to show me the place. Mehdi incredulously asked him why, if his people knew there was hidden treasure there, they had not looked for it, and he had to confess that they had made many an unsuccessful search.

A mile south of Jabal Buruj al Majarib we struck again into the sand-dunes of Jafura and, after climbing and descending for about a mile, camped in the trough. The reasons for selecting a hollow between two dunes for the

¹ In the Hasa the northern part of the Great South Desert is spoken of as Al Rimal, and the southern as Ahqaf, and Ruba al Khali is not even understood.



32 THE CAMP IN THE SAND DUNES OF JANAH JATURA



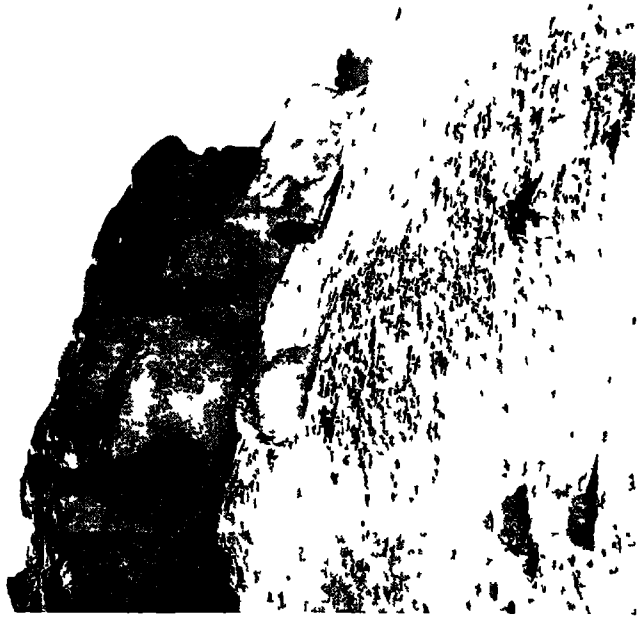
33 ON THE HASA-JAURA BOUNDARY

night's rest are threefold. The evening fire is visible for only about a hundred yards, whereas on the plain it would attract the attention of a prowling raiding party over long distances and invite a night attack. Then, too, there is always more grazing among the sands. The contrast between the vegetation there and on the gravel plains was marked. In the dune country the plants were larger and in far greater variety, and at the time of my visit most of them had already sprung into strong young growth and were in flower; whereas those on the gravel plains looked dead and were practically confined to one species, the *Arfaj* (*Rhanterium eppaposum*) (Plate 30). On the gravel plains it was only in slight hollows where sand had accumulated that we occasionally found the *Arfaj* showing green shoots and its small yellow flower. The reason for this is that the sand has the power of absorbing and retaining dew and, of course, rain if it occurs, while the gravel has not. The camels' favourite plants are *Arfaj*, *Aabel*, and *Hallam*, chiefly because these three are in flower at this season. They spot them a long distance ahead, and there is a race between two or three to get there first. In about three grabs the bush is robbed of all its new foliage. *Hallam* is a small herbaceous bush with purple flower, and the whole plant disappears into the capacious jaws. I now realised that the sands were the nomads' best grazing-grounds and were not the lifeless wastes I had imagined; also that, even if there be no rain, the winter's dew is sufficient to start a growth during spring and early summer until the summer heat once again scorches and dries it. In rainy years a more luxuriant growth naturally results. The scarcity of wells in dune desert, and the necessity of watering the camels every five or six days, are facts that control the movements of all the roaming tribes. The third reason is of minor importance: one is sheltered from the wind.

Our camp on the night of February 12th lay in Janah Jafura, or Wing of Jafura (Plate 32).

[February 13.] A gentle north breeze, but bitterly cold. Everyone was walking about with numbed fingers and toes. I could hardly hold my pencil to make notes in my pocket-book. Starting half an hour after sunrise, we plunged on through soft sand-dunes rising forty feet from trough to crest. My beard and *kafyya* became white with rime that made my face cold and clammy. We crossed the southern boundary of Hasa among dunes that all looked alike (Plate 33). It was pointed out by Saleh, who probably has a fair idea of its line. In the trough of a big dune we came upon a large nest in an *Abel* bush only eight feet high (Plate 35). A Brown-necked Raven flew off as we approached, and sat on the point of a distant mound. As I had never seen the eggs of this species, it was with delight that I found six of them in the nest. One is used to thinking of a Raven's nest as being invariably on an inaccessible cliff, and it seemed absurd to find this one where it was, quite the easiest to reach and take of any birds' nests I had ever seen, not excepting that of the early spring Blackbird of my youth. It made one conscious that one was at last out in the real desert, where totally different conditions prevailed. As a matter of fact the nest was not visible from any distance until one rose over the immediately surrounding dunes; as the tribes do not come here until some three or four months later, nothing would normally be likely to disturb it, and this pair of Ravens might consider themselves most unlucky that I happened to pass that way. We were quite unprepared to pack eggs, but they were placed in a tin filled with sand, and travelled well enough till evening in spite of the jolting. They were then blown and safely stowed in cotton-wool.

We marched southward and a little west, leaving Jabal Huwaitiya on our right, and at length saw that we were approaching the end of the dunes. On the horizon appeared a long level dark line that might have been the



34 JABAI KHARVA ZARNUQI, HASA, NORTH EASTERN CRAGS,
SITE OF NEST OF LONG-LLGGED BUZZARD



35 NEST OF BROWN NECKED RAVEN IN "AABEI" BUSH,
JAFURA DESERT

sea—actually the vast gravel plain lying to our west, thickly scattered with the hardy *Arfaj* bushes. You finally step suddenly from the dunes on to the gravel, and the travelling is much improved and faster.

There were still a few small hills in our course, such as Buruj al Hasan and Jabal Harmaliya, chalky sandstone cones not more than 100 feet above the plain, but of the greatest service, inasmuch as they could be connected up by angles with those we had left behind. Our direct course from Zarnuqa to Jabrin would lie almost the whole way through the dunes, but Saleh, by taking us a little westward, had given us the advantage of travelling over this plain and we were now tending almost due south. A few miles to our east the white crests of the high dunes could be seen, and we followed their line almost the whole way to Jabrin. On our west was the dark flat plain to the horizon. In the evening we turned towards the sands, to camp in their sheltering billows. Birds were very scarce; we raised two Desert Wheatears (*Ænanthe deserti*), and two Swallows appeared and caught flies from our camels with a loud clap of their beaks. There were also three Bifasciated Larks (*Alæmon alaudipes*) that seemed to have mastered the problem of living without drinking; they could certainly get dewdrops from the bushes on some mornings just now, but in the summer they would probably still be here, and in that case would have to live without moisture through the hottest months. Their footmarks, running from bush to bush in the sand-dunes, were one of the regular features of the day's march, and a few birds apparently covered an enormous amount of country. There was also one Desert Lark (*Ammomanes*). These I consider unable to exist without drinking, as they are often seen imbibing freely at wells; but at this time of year they are probably able to visit fresh country on tours of several days' duration in search of food, and thus we found them far from water. The dragon-flies were frequently seen throughout the day,

all travelling north in the teeth of a strong north wind.

For camp a hollow was found three miles south of Jabal Dharabin (Plate 36), and it was not considered necessary to resort to the Jafura dunes, as the small sand-hills provided all the grazing and firing necessary. The sandstone of this mound was shiny and seemed harder than that farther north. I was able to connect this hill with my spider's-web of angles reaching to Hufuf, and found another mound, Jabal Harmaliya, to the south for the next day.

[February 14.] The coldest morning that I recorded, but windless. Muhammad Hasan proudly brought me a specimen of a delightful little desert animal, one of the true Gerbils (*Gerbillus*), about the size of a dormouse, with most delicate shades of pale fawn colouring, pure white underparts, and enormous black eyes. He had caught it staring into the fire when it was first lighted. Gerbils seem to be overcome by curiosity, for on searching the camp I found the little footmarks running everywhere. All our baggage had been examined, and one had even come into my tent and inspected me as I lay asleep.

We soon passed Jabal Harmaliya, nothing more than a range of small mounds, which was to prove the last feature I was able to link up with those we had passed. Further south there was an unbroken line of nothingness, mere earth and sky. We had one short break for coffee in the mounds and, just as we were starting again, Khalid saw a Hare squatting in a bush and borrowed Muhammad's rifle. We all passed on, for it was quite close to our path, and our stopping would have made it jump up and run. I waited a little way off to see the stalk. The two men who returned approached it, walking hard in diminishing circles, until at last they were following each other in a round of only twenty yards diameter. It suddenly occurred to me that I might be in the line

of fire, but not knowing exactly where the Hare was, I could not tell where to go to get out of it. Luckily the camel took the right direction. The men stopped and fired into a bush, and the rebounding bullet whizzed past where I had been standing, having first disembowelled the Hare. The procedure of walking round is, of course, known to every English poacher, and it was strange to meet it again here. It was a small Hare, not so big as an English wild rabbit, although quite full-grown. It made up for this by having enormous ears. The fur was of the beautiful shades of pale buff and cream generally known as desert colouring. It was found to belong to the same species as that previously obtained at Salwa. Although it had been completely disembowelled by the bullet, its throat was cut by the Arabs, and it was quite ruined as a specimen. Roasted in the embers it made a welcome addition to the evening meal; boiled rice and dates were growing a little monotonous as an invariable daily menu.

The plain made travelling very comfortable; our course was due south all day. The horizon was as level as that of the sea, and we seemed to be marching in the bottom of a basin with the horizon for its rim, to which we could never to all appearances get any nearer. The impression was therefore one of continually going uphill, but as a matter of fact the surface was probably dead level. It would take cars of any weight, and they could travel at any speed. The ground was strewn with most remarkable pebbles of all sizes and shapes and colours, white, black, red, green and yellow predominating, and there were a few lumps of fossilised coral. The blown sand polishes their surfaces so that it would be easy to imagine they were the work of a jeweller. Another kind of stone has a rippled surface due to a different agency. The shapes are so varied that they look like pieces of broken statuary; hence has arisen among the badawin the story that these are the remains of an ancient city.

With a little imagination almost anything could be found, from the hoof or leg of a horse to the breast-bone of a bird, and unlimited stone arrow- and axe-heads, all beautifully polished.

Towards evening our horizon was crossed by a line of high dunes running east and west. This is a narrow tongue of sand not more than a mile or two wide, called Barqa Dhumairan, and according to Saleh it joins the dunes of Jafura to those of the Dahana and therefore forms a sand-barrier dividing the two large expanses of the gravel plain. We passed it by going into the dunes of the Jafura and so travelled round its base, where the slopes were gentler; Saleh said that although the strip is narrow the dunes are steep and soft in the Barqa Dhumairan.

It was getting dusk, and we were now travelling from sunrise to sunset, so a weary party of men and camels camped in the sands, having journeyed, as I afterwards discovered, twenty-nine miles during the day. Saleh called the place Zaida Jafura. We expected to cross the Wadi Sahba about noon on the following day, which was disappointing, as I wanted to stay the night and take stars for latitude. Otherwise the only way of getting this would be to estimate the distance travelled since leaving Zarnuqa by the number of hours we had marched. This number was accurately booked, but the number of miles done per hour varied, so that any estimate was bound to be very rough and unreliable; and it was very important to get the correct position of that unknown channel. Muhammad Hasan was becoming nervous about raiders, especially when we kept the lamp burning while I tried to keep notes up to date or Mehdi was skinning animals. When we travelled all the hours of daylight there was no time to be lost on getting into camp. It meant incessant hard work when an hour's rest would have been very welcome, and we could not delay a day, as Muhammad was anxious lest our water-

skins should give out before we reached Jabrin. Bearing in mind the possibility of meeting hostile Arabs, he did not like my riding far ahead of him. He said that the Sultan could not tell how far Hamad, a newly-recruited Ikhwan Shaikh, would be ready to receive me, an infidel, and his tribe were very fanatical. It had been impossible to communicate with him beforehand, and I was to wait outside Jabrin while Muhammad Hasan and Saleh rode in with the Sultan's message asking him to receive me as an honoured guest. Another cause of anxiety was that we might meet with a party of Al Murra at night, and they, mistaking us for the raiding Awamir, might start a battle, only finding out we were really friendly after casualties had taken place on one side or on both, for we should be in no better position to know who they were.

We saw the result of the recent rain in the dunes here. By digging eight inches down into dry sand, you came to damp sand. This power of the lower layers to retain moisture round the roots of the shrubs was a great surprise to me, and would be little suspected from a survey of the dry surface. Now that it is known that moisture can be retained at such a depth, it need not surprise us that it should remain for several months, since evaporation by wind and sun can have very little effect.

[February 15.] The dunes round our camp this morning were enveloped in a heavy white fog. We could not see more than 100 yards, and the men had to be careful not to let the camels stray off to graze as they usually did as each one was loaded. There was also a heavy dew. All the bushes had drops hanging from the branches and dripping to the ground all round them. Just as the sun rose a ghostly white rainbow without any colour whatever was visible when I turned my back on the sun, suspended on the fog at a distance of twenty yards. I have never seen the like before. My *kafyya* and moustache were white with dew as we rode along and made

my face very damp and chill. We struck through dunes looming up fifty to sixty feet between trough and crest. They were well bushed, and grazing was good. We let the camels snatch at the green bushes, providing they did not halt. On such journeys no one knows when they will get the next opportunity, seeing that, although the first consideration is to camp in the best-bushed areas, it is quite likely that a night may be spent where there is practically nothing to eat. It was very evident now that the journey would have been impossible a month ago without serious losses among the animals, as there would have been nothing but dry bushes day after day. Among the dunes we passed the fresh tracks of one Houbara Bustard and a Gazelle, which raised our hopes of meeting game.

We were soon out in the gravel plain once more and marched the whole day among the weirdly shaped stones, some of them as round and smooth and large as croquet balls. It is here, Saleh told us, that stones are sometimes found walking about under their own power. This phenomenon is supposed by the nomads to be the work of spirits and is generally believed to occur. Saleh said he had seen stones walk in the Jafura and Sahba deserts over which we should be passing for the next two days, and had no doubt that, if we looked out for them, we should see several. He said they might be any colour, but were round and about the size of a hen's egg, and they made a zigzag course in the sand; with his finger he drew a diagram in the sand, which I copied, as it is difficult to describe. By crossing its own track the stone makes a series of irregular loops and does not follow a merely winding or straightforward path. We rode along with our gaze fixed on the sand. Beyond the peculiar polished stones and occasional lumps of coral, there was nothing of special interest. The horizon remained about two miles off in any direction, and there was no more to relieve the monotony of the landscape

than there is in the calm ocean it so resembled. My diary for the day recorded the fauna in three words: "No birds seen." As a matter of fact, "Nothing living seen" would have been more accurate. Not even an eagle soaring in the distant sky, not even an insect among the stones, in all the twenty-two miles of country we crossed that day—truly a god-forsaken land!

We were actually travelling parallel with the edge of Jafura desert to our east, marked by the edge of the dunes. Where this meets the gravel there are generally a few isolated mounds of soft moving sand some thirty feet high without bushes (Plate 37). Then comes the outside border of the dune country—usually smaller piles, also bushless and connected to each other; but in the trough the gravel plain shows through the thin sand. Further in the interior come the high moving dunes of soft sand. The windward side is a gentle slope up which the sand is blown in a film during a wind to fall over the cliff on the leeward side, forming as steep an angle as the loose stuff will support. This alternates with areas where the bushes have obtained a footing and the sand is more stable in consequence, and the slopes less steep.

The gravel plain north of the Wadi Sahba is called Saramid (Plate 30), and since it runs northward, according to Saleh, it must be linked to the Summan, also a gravel plain with similar characteristics. As we were expecting to reach the Wadi Sahba at noon, we pushed on without allowing the customary halt for coffee; but afternoon hours were passing and still there was no sign of our getting over the horizon. At last, to everyone's satisfaction, Abu Saud said he could go no further, dismounted near a patch of withered bushes, and commenced to make a fire and boil up the coffee. It was a great relief to walk round and stretch cramped limbs and muscles and gather a few of the best polished stones. The grading of these pebbles is not easy to explain in view of the fact that it cannot be the result of wind. In one place there

are plenty of all colours the size of your head, further on they are the size of hens' eggs, while if you require some the size of peas, you have only to walk still further on, where you will see nothing but the smaller kind. The grading is more marked in the smaller sizes.

Knowing that it was of the utmost importance to stay the night in the Wadi, I was by no means disturbed at the turn events had taken, as in all likelihood we should reach it about an hour before sundown and camp there in the ordinary way. In fact the men were talking of it now without any prompting from me, but it depended whether there was enough bush there to satisfy the camels. The line of the famous channel that had troubled the minds of geographers from the earliest times was just visible as a range of low hills about three miles away, cutting across our course at right angles, that is, as I had expected, it ran westward to eastward. We reached the north bank and looked down the gently sloping incline on to the bed, and across it to the rise on the south bank about a mile away, on which was the row of mounds that had first attracted our attention. Both to east and west the course was plainly cut out through the great plain as far as eye could see. The first impression was that here had once been a great flowing river, and this was followed immediately by the mental inquiry, What has become of the torrents that once carved out this great gully? We had come to the bank quite abruptly, so that apparently the land only falls in the immediate vicinity of the course, and the lie of the surrounding country does not suggest that its drainage area ever contributed much to its volume. The only solution that can be offered is that the water was entirely drawn from the hills of Tuwaiq and other ranges in Najd, which must once have enjoyed a much heavier rainfall than they do at the present time—a theory which is, of course, generally accepted.

It was now nearly our usual time to camp, and my

first glance showed a fair amount of scrub in the sandy valley, much more than in any of the barren region we had been passing over. I forthwith hastened to express my fear that on the other bank we should strike another equally arid tract, and urged that for the camels' sake we ought to remain and make the best of what the Wadi could provide. Much to my relief, Muhammad Hasan was soon led over to my point of view, and couched the camels and began to unload. Next day, when we saw that my prophecy was true, I gained an undeserved reputation for foresight.

There was no time to be lost, as I hoped to get the height of the banks above the bed before it was too dark, so the theodolite was erected, and the first operation was to take the correct bearing of the river's course up and down stream with the compass, and read the aneroid. I also took the temperature of boiling water with the hypsometer to find the altitude above sea-level. I estimated the banks to be fifty feet above the bed. Light failed before we had everything ready, so I took the North Star for latitude as soon as it could be distinguished in the theodolite telescope, and then selected an East star for longitude and began on Sirius, which was at a good elevation. The angle-book was placed on the lamp-box with the pencil near by, and the hurricane lamp threw a light on the page. Mehdi held the electric torch near the telescope to show up the cross-wires, while with my left hand I held the chronometer-watch in such a position that the fitful gleam from the lantern fell on the dial while my right hand wandered round the instrument in the dark, finding and turning the thumbscrews to get the star on the central wire. At the moment of contact a hasty glance at the watch, and the second and minute were read, providing, of course, that the dial was still illuminated by the unsteady ray. It was quite easy for me to shift my position slightly and then find the dial in the shadow and illegible, and in that case

we had to begin all over again. When the time was ascertained it was hastily written in the book, and Medhi took the watch from me in exchange for the electric torch, a pass performed with the dexterity of jugglers, and turning the light on the spirit-level I proceeded to read the small divisions, providing, of course, that the bubble was visible. It was not so always, and we then had to level the instrument once more and start operations afresh. Sand does not make a very firm base for the instrument's legs. Providing all was well, the level had to be written in the book, and the torch held against the scale at the correct position in order to read the angles through the two eye-pieces of the micrometers in degrees, minutes, and seconds, all of which had to be similarly recorded. We were then in a position to draw a long breath before focussing once more on the star, which in a few minutes travels across the little telescope's range, and repeating the previous performance. As four observations on each star are the minimum required for a good result, it can be imagined that star-work under the above conditions was no light pastime.

I have given a detailed account to enable the situation to be appreciated when I say that, just at the moment when I was reading levels, and when concentration of mind on the work in hand was essential, I was conscious of a figure silently advancing from the darkness and gliding up to me with the suggestion that I had better put out the lights lest a prowling band of the Awamir should see them. Of course, all the figures I was trying to remember vanished from my mind, leaving me free to tell Muhammad Hasan that I was making all the haste possible and to indicate with some asperity that the further he was away the quicker I could work. It was rather disconcerting, as my efforts to concentrate again were not successful, but I finished Sirius and went on to the West star, selecting Deneb. We had reached the middle of the four observations, when Muhammad Hasan,



36 JABAL DHARABIN, ONE OF THE RARE, SMALL SANDSTONE HILLS BEYOND THE HASA JAFURA BOUNDARY



37 WHIRL THE SARAFID GRAVEL ITAIN (FOREGROUND) MEETS THE JAFURA SAND DUNE



38 WATER WORN PEBBLES IN THE BED OF THE WADI SAHBA



39 IN THE BED OF THE WADI SAHBA, THE BANK OF THE WADI FAINTLY VISIBLE IN BACKGROUND

avoiding me, came up to Mehdi and began a whispered conversation. Had he shouted in my ear, the effect could not have been more fatal; still, I knew he was doing his best and did not realise. We completed the set, put out the lights, and packed and put away the instruments in the dark. It was not surprising, however, on working out the results for Sirius and Deneb on arrival in England, to find there was an error somewhere in the figures that made the whole lot useless; the two longitudes resulting were so far apart that undoubtedly at least one false figure had been booked, and the exact longitude was unobtainable. Luckily the two latitudes proved each other. As this was the most important figure in fixing the position of a Wadi running east and west, I have never ceased to congratulate myself that it was obtained. With the lamp out I could do nothing but go to bed and try to get all my notes written up at daylight next morning.

Saleh told me that the Jafura sands completely blocked the Wadi bed a few miles east of where we were, but the course was still plainly traceable through the dunes on account of their height being less. On the north side and in the middle where we camped, the bed is covered over with sand blown from the surrounding wind-swept plain; but by digging six inches down, sand almost as hard as conglomerate was encountered, and this, I thought, must be the original bed of the stream deposited when it was a watercourse. This sand was examined by Mr. W. Campbell Smith, of the British Museum (Natural History), who pronounced it to be water-worn. Towards the south bank I was able, the following morning, to find some of the old river-bed exposed. A white silt had settled round the pebbles, binding them together to form a hard conglomerate, and as Mr. Campbell Smith found on examination that the pebbles were water-worn, it left no doubt that this was the bed laid down when the Wadi was a flowing river (Plate 38). The centre of the Wadi bed is

picked out with *Salam* bushes (*Acacia flava*) (Plate 39). The afternoon had been unusually hot, and I had felt thirsty for the first time on the march and had made use of my water-bottle, which had not been needed before since leaving Hufuf.

[*February 16.*] In the middle of the night a rifle-shot rang out quite close and put the men in a state of commotion. Figures arose from where they had been sleeping among the baggage, grabbed rifles, and crept up behind the more bullet-proof boxes, and in less time than it takes to write the camp was in a state of defence. While I waited for the next shot my mind reverted to the lamp and torch episode, and I wondered how much of the blame would be attributed to my operations. There was a long silence and then some voices, and at last Muhammad Hasan came into the tent to say that our visitor was a Wolf, and that one of our own men had awakened just in time to see him going off with a water-skin that had been almost emptied the night before, and had shot at him. He missed the Wolf but made him drop the skin. "Fancy," he said, "frightening us all like that just to salam with a Wolf!" In the morning we found our one remaining full water-skin had had a narrow escape from being torn open and emptied. The careful Muhammad Hasan had had the foresight to bring it into the tent for safety and lay it beside himself and me. We could trace the footsteps of the thirsty marauder coming up to where we were sleeping, but not quite near enough to allow him to grab at the skin. His courage had failed only at the last moment, and he had gone back to make the best of the little water left in the other skin and had not been permitted to enjoy that. Wolves are far in advance of any other animals in intelligence and daring, and the Arabs tell fabulous stories of their sagacity. This brute must have watched long, knowing that when everyone was asleep his chance would come; the power of smelling water at

a distance is a sense we cannot realise, and must be developed to a high degree. We came upon a dead camel not very far off, possibly the result of one of the Awamir raids, and on this the Wolf may have been feeding. It had been dead about a month, but there was plenty of meat left, and its condition might well be conducive to thirst.

The watershed on the south bank was as difficult to place as the other. One seemed to rise fifty feet up the gently sloping bank and gain another level gravel plain stretching away southwards. On our east the Jafura dunes were again occasionally visible on the horizon. Saleh said they ran south to a group of wells, Bir Aziz, which are in the middle of the sands, being considered the boundary between the Jafura and Al Rimal deserts. They would also be used by Oman tribes raiding towards Jabrin and, of course, by the Jabrin raiders returning the call.

Almost the whole day was spent on the large plain. Occasionally slight depressions had collected sand sufficient for the *Arfaj* bushes to get a footing, and some of these would even hold a Hare. I examined the form of one that the men had shot. The Hare was in a leafless bush and had selected one with stout branches, so that a bird of prey, stooping from above, would not have been able to crash through, but so sparse that the animal would have been plainly visible had it moved. They keep quite still, however, and Hawks and Eagles seem unable to distinguish their prey unless it moves. The protection afforded by desert colouring, especially in the case of defenceless animals like Hares and Houbara, is their chief means of survival in life's eternal battle, never more desperate than in these arid countries.

The land immediately adjoining Sahba was called Jau al Sahba, or Sahba depression, and it is not unlikely that the surface does fall slightly towards the Wadi for a few miles, although I failed to perceive it. Our next change

of landscape was a row of low mounds breaking the even line of horizon to the south and running east and west. They heralded our approach to Jabrin, for they lie to the extreme north of the oasis. We first passed through the broken rubble of sandstone mounds twenty to thirty feet high for some three hours, and Saleh gave the name of Jabal Aquila to the whole wide range and the district. At last we came to the edge of the plateau and gazed out over a large shallow basin from which the hog's-back sandstone hills arose in much the same way as at Hasa, the furthest appearing to be about eighteen miles off. It was a great relief to get a vista at last, and to escape from the eternal two-mile horizon was like awaking from a nightmare. Saleh pointed to one of the ranges, some twelve miles off, behind which, out of sight, lay the palms of the oasis we had come so far to see. The sides of the hills were rather steep, and we had to keep a southerly course to give the camels a better gradient, although south-west would have been more direct. This led after two or three miles, still descending, to a bush-covered depression. Saleh had been untiring during the day in collecting Lizards; he was just beginning to grasp what I wanted, and an understanding had sprung up between us. In fact we had mutually realised we were kindred spirits. Most of the collection on the gravel had been confined to Lizards because there was nothing else, and these were all of the *Agama* tribe, fleet-footed and with faces like gargoyles. They depend for safety on speed, that is, they do not have burrows, but keep motionless among the stones, which they strongly resemble; and it is only when a camel nearly treads on one that it moves and races away nearly as fast as a man can run. Saleh, off his camel in a trice and legging it across the plain, seldom failed to return triumphant, and having delivered the spoil, had yet another run to catch his camel, which was by that time grazing a long way behind or walking in the opposite direction.

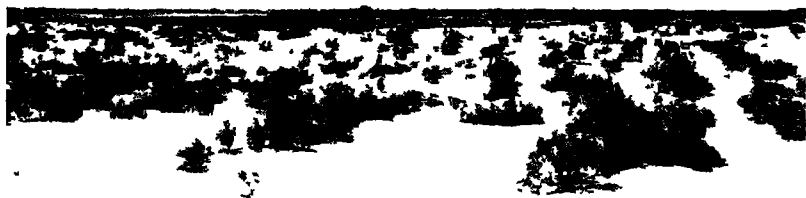
As we descended Jabal Aqula, he ran in advance out of sight, rifle in hand, and left us far behind. I asked what it was all about. Muhammad Hasan said deprecatingly, "He is only a badawin, and thinks there may be some Gazelle on that bushy plain, and wants to shoot one before the caravan appears and frightens them. You never know what a badawin is going to do next," he added, with an air of great superiority. We found Saleh waiting beside an old ruined castle called Mishash al Aqula, evidently an outpost in the times when Jabrin was occupied (Plate 41). Nothing is recorded about the ancient inhabitants of the place. The Hufuf officials say that its buildings have been deserted for 600 years, and as this is the only opinion I have ever heard, it may as well stand until something more definite is forthcoming. There was a dry well near by. The castle walls were built of large, square sun-dried bricks made of mud mixed with straw and measuring $5 \times 10 \times 4$ inches. They were even now very hard. Part of the wall still standing was ten feet high, but the whole edifice was much too far fallen into decay to convey much idea of its original shape.

There was another nest of the same kind of Raven, this time in a higher tree and more conspicuous, but protected from robbery by the large savage thorns of the acacia—at any rate, from the bare-footed badawin. The bird departed on our arrival and sat through the night on a hill-top at a safe distance. Ravens are extremely wary, and although often seen, never leave anything to chance if you have a rifle. I badly needed at least one specimen to identify them. My bones were very sore, as I had changed camels with Muhammad Hasan, whose mount was a free mover but tired me more in the day's ten hours of marching than my own had in all the other days put together. The reason was that Muhammad's mount had been on the northern grazing the whole winter and was fat and strong and moved forward with

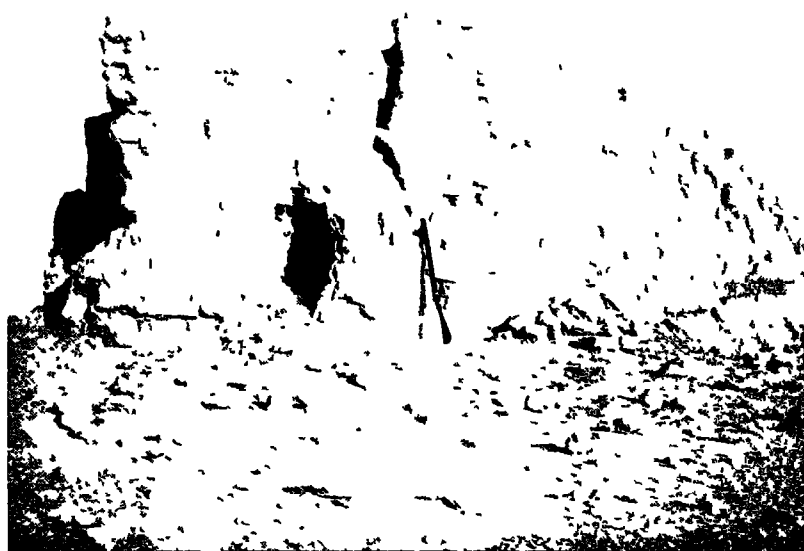
vigour, whereas mine had only been a short time on the grazing-ground and was thin. It required continual application of the stick to keep it up to the others and it daily lagged further behind; but its paces were so much more comfortable that I returned to it next day with far greater appreciation. Before undertaking a long desert journey it would be essential to know something about camels and purchase only those that had been feeding well for some months previously and had plenty of reserve strength; otherwise even first-class animals would begin to drop out in the first week.

We expected to reach Jabrin without any effort on the morrow in four or five hours' march. It was to be hoped the Amir would agree to receive me, as we needed to have our water-skins replenished. We had very little water left. The afternoons were beginning to get warm. Between 2 and 3 p.m., local time, the temperature was about 84° in the shade, and the Arab head-dress hardly afforded sufficient protection from the sun. I tried my English soft felt hat under the *kafiyya*, and it was an unqualified success. The difference could not be noticed by anyone we met, it gave ample protection, and the brim kept the cloth of the *kafiyya* clear of the neck, where it had been inclined to cause a stuffy sensation on a hot day.

[February 17.] I had to let the party go on while I waited for the sun to rise sufficiently to let me take a photograph of the ruins; meanwhile I discovered that there were the remains of three separate buildings. We were still descending by an easy gradient southward when we started; in fact the land falls more or less all the way from the ridge of Jabal Aqla to Jabrin palms. As the altitude of the range was not taken with the aneroid, it has only been possible to estimate it from the altitudes of Jabrin well and Wadi Sahba, which were carefully taken. A row of hills called Jabal Tawal al Aqla, more conspicuous than the rest, lay near our path, consisting



40 THE FIRST VIEW OF JABKIN, FROM THE NORTH. PALM TREES ON THE HORIZON



41. QASR MISHASH AL AQLA TWIIVI-BORI GUN AGAINST WALL TO SHOW DIMENSIONS

of sandstone, very much broken up into rubble, raised about 100 feet above the plain and half a mile long. The way we had taken from Wadi Sahba had been free from sand-dunes, and cars would have found little difficulty in getting over it; perhaps the sides of Jabal Aqla near the crest of the range would be soft and steep, and might require a little manœuvring. Now we were once more among sand-hills, not very extensive, but lines of soft moderate-sized dunes, alternating with stretches of hard level ground. One area of sand-dune was well bushed with *Gadha* (*Arthrocnemon fruticosum*) (Plate 57), one of the best plants for holding the dunes. The sides of the mounds were riddled with the holes of the Jirds living among the roots, and the inhabitants were scampering about in the sunshine. In the glimpses we caught, the pale sandy colour of their coats looked unfamiliar, and I felt sure they would be quite a new species. It was impossible to stop, for even if we could have dug some out, it meant too big an excavation, and we were going to be many miles away before we camped for the night. I could only make a mental note of the place and insist on spending the night there on our return journey, which we eventually did with much success. On the next piece of country, a plain with small gravel, a Jerboa appeared from under our camels' feet and streaked across the ground with bounds like a miniature Kangaroo. It was the first we had seen, and I was very anxious to get one, but by the time we could beat our lumbering camels into a trot the Jerboa was out of sight. Future plans were discussed while we halted for coffee, and I hastily took compass bearings on all the kopjes I could see, hoping some would come in useful. Muhammad Hasan and Saleh were to ride on in front from here to see Hamad ibn Maradvath, the Amir, and take the Sultan's message, asking him to give me a friendly reception and see that no harm came to me while in his province. It was not considered likely that the Amir would be hostile. However, the Sultan

was not sure, and could not tell how he would handle his very fanatical Ikhwan tribesmen. Besides having so recently adopted the Ikhwan tenets, they had never been visited by a European before, and, having no warning of my approach, might show resentment. For these reasons, the rest were to wait with me, and we were not to come within view until we were sent for and given the assurance that the Ikhwan thermometer was down to normal.

We spent the time hunting Hares in the last line of dunes adjoining, and actually encroaching on, the first patch of date-palms. There were plenty of bushes, a Hare was soon on the move, and the men in full cry, when a fine black Eagle appeared from the sky and swooped down on the hare, missing it by several feet as it took cover in some bushes. Behind the Eagle came a Raven, giving a clown-like imitation of all its turns and evolutions, only much slower and getting left far behind. When they had recovered from their surprise the men remembered the Hare and, thinking it was as good as theirs, borrowed my gun and went up to the bush, while the Eagle stayed overhead watching proceedings, or, in falconry parlance, "waiting on." The Hare was more than holding its own and had gone unperceived to some bushes twenty yards ahead, whence it dashed out across some open ground. Down came the Eagle again, with the Raven a bad second, and missed once more owing to the proximity of the men, and the Hare gained thick cover. When the men got there they tracked it some distance until it went into a burrow too deep to be dug out, and there we left it. The camel is a useless beast where shooting from the saddle is concerned. You are bound to put down the guiding-stick to hold the gun, and the psychological moment for the shot is always chosen by the brute for turning its own back and yours on the game.

The first impression of the Jabrin oasis was rather depressing. The palms that were grouped here and

there about the sandy spaces were semi-wild and utterly neglected. Instead of the evenly spaced and regular rows of well-tended trunks familiar in Hufuf, there were usually two or three tall trees with a mass of small trees and shoots round them, all struggling for existence. Nevertheless, it is a fact that in spite of this neglect a considerable quantity of dates is grown every year. The palm area seemed to extend about five miles north and south and two miles east and west from where we caught our first glimpse over the brow of Jabal Jabrin Shamal. Saleh had carried on his roseate descriptions up to the last night over the camp fire. Now, gone were the running streams and the plains teeming with Houbara and Gazelle. Stripped of all its imaginary glories, Jabrin presented only the remains of an ancient civilisation carrying on an unequal struggle against the sand desiccation that was enveloping it on all sides.

CHAPTER XV

JABRIN

EVENTUALLY Saleh turned up, all smiles, and said the Shaikh was prepared to welcome me. We were now travelling west and keeping to the north of the palms. Some cultivation was in progress as evidence that the influence of the Ikhwan movement was not wholly military. The Sultan is making great efforts to induce his badawin tribes to abandon their nomad habits and take up the more peaceful pursuits of agriculture and a settled existence. The first efforts of the Al Murra were now before us. Small patches of young wheat were being grown. Irrigation was supplied by small lifts worked by donkeys that ran along the ground to pull the rope. This is the badawin system of working wells, whereas the gardeners in permanent oases excavate inclined runs for their animals. The water was only about twelve feet below the surface. The settlement that Saleh had dignified by the name of *Dira* (town) was nothing but an encampment of black and white wool-woven tents (Plate 42). One rather bigger than the rest was the seat of Government and the abode of the Amir and his family. There was also a rectangular masonry building of rough blocks of sandstone of most primitive workmanship, such as a tribe who had never given a thought to such matters might be expected to construct, resembling nothing more than a dust-bin. It was, however, spoken of with great pride. It gave the impression that the Amir must have been ordered to build a town if he wished to hold his position under the Sultan; but he had not so far developed the colonising spirit as to leave his tent and live in it. It can



42. MUHAMMAD HASAN TELLING WATER-SKINS AT JABRIN WELL BEHIND HIM
THE AL MUKKA VILLAGE



43 GOATS IN A DUSTSTORM, JABRIN.

easily be imagined that by the time reports reached Hufuf on the lips of the badawin this little one-roomed shanty would have grown to the dimensions of a magnificent palace occupying a central position in the town of Jabrin.

We pitched our camp on a small chalky sandstone plain not far from the well, but on the opposite side and some distance away from the badawin tents scattered about in the trough of the sandhills. My tent had been up about half an hour, and as Muhammad Hasan had said that the Amir would not come and call just yet, I had lighted a pipe, when he dashed in crying, "The Amir is upon us!"

Stuffing pipe and tobacco-tins and other incriminating evidence under the valise, I went out to meet him, while Muhammad Hasan tried to waft the fumes out with a duster and arranged a carpet for his reception. I brought him in, and he sat on the floor on the carpet, while I sat on his left on my bed, also on the floor. He was a thin, spare man of about forty-five, with skin not much darker than that of a sunburnt European, and a black untrimmed beard of short growth (in fact, these badawin have very little moustache, beard or whiskers). The eyes were dark and rather close together, the nose small, the features regular and the lips thin—a face that was handsome, but of a type usually associated with cruelty. He wore the dress of an Ikhwan Shaikh, which is chiefly characterised by the more voluminous all-white kerchief wrapped round the head. His greeting was civil, dignified, and cold, and I never saw him smile. He made it quite clear that as it was the pleasure of the Sultan—Abdul Aziz, as he called him—that I should come, he would do all he could for my safety; and by repeating that it was on this account only he delicately implied that in other circumstances my reception would have been of another kind. He showed a little animation when mentioning the raids that had recently been made by the Awamir. Their lands, he said, were only three or four days' march from Jabrin, and knowing that his tribe were weak, owing to their forces

being mostly in the northern lands, they always chose this time of year to raid him. In a few months' time his own camels would be based on Jabrin and there would be no fear of the Awamir coming near. The southern part of his lands had been without rain for two years, and it was six years since they had had good rains. He asked me to let him know beforehand where I wanted to go, and he would send two armed men on horses to gallop in a wide circle outside that area to look for tracks and avoid the risk of my being ambushed by the enemy. He said with pride that when the dates were ripe, and all his men were congregated round about to gather them, it was a fine sight. The Amir drank tea and coffee, and, to my surprise, Muhammad Hasan produced a censer and incense, the one little luxury allowed by this fastidious religion. In fact, our entertainment was carried through in the most correct style.

As soon as our visitor had left, I congratulated Muhammad Hasan on his forethought and asked who owned the censer. He said shyly that it was his and he had bought it for a riyal. It was made of some kind of black china and looked like a figure eight. He would not satisfy my curiosity further, but explained that this kind had a great advantage over the usual wooden ones, as the latter were liable to catch in a guest's beard and pull out the hairs, while his was smooth and could not offend. Mehdi, however, supplied more information, and I then recognised it as an insulator off a telegraph pole, and thus the story of its origin came out. During their occupation of the Hasa the Turks had the forty miles between Hufuf and Oqair connected by telegraph wire, and they left the equipment behind when they were turned out by the Sultan in 1914. Some enterprising native of Hufuf obtained the insulators and made a small fortune by selling them for a riyal each as censers.

There was very little livestock apart from camels. The Amir had a small flock of black goats and promised to send



44 IBN JITUWI'S FAVOURITE SALUKI, "DHABI" (OF THE
SHOW I COULD BRID)



45 THE SALUKI, "NAJMAN OF JABRIN"
(2ND PRIZE, HOLLAND PARK CHAMPIONSHIP DOG SHOW,
LONDON, APRIL 1925)

me some fresh milk every morning, which was very welcome, as the slender fare of the last few days had had more effect than I had expected. There were also a few donkeys owned by the cultivators, and I saw a few shrouded women riding out on them to the palms to gather firewood. A very thin Saluki puppy visited us and was even grateful for the stones of the dates that we threw away. It was not on good terms with a pack of pariah dogs that could be heard chasing it out of the badawin camp, the Saluki ambling along unconcernedly ahead while the slower pack were straining every muscle *ventre à terre*. This Saluki was not smooth-coated like the Hufuf hounds (Plate 44), but had feathered ears and legs, and the tail towards the end had long hairs. The colour was exceptional, a very pale black and tan (Plate 45).

An hour after our reception of the Amir, he announced his intention of coming again, and followed quickly on the message, bringing another tribal magnate, Shaikh Rashid ibn Daleh, a much younger man, inclined to be a little more luxurious in his dress, for he wore one of the silver-mounted daggers set with turquoise. He was also decidedly tall, straight, and handsome. He explained that he was in charge of the southern half of the oasis and would be Amir under Hamad, and that in the summer when he could get more labour he intended to build a house down there like the one I have already described. We went through the same state performance, and I threw into the entertainment an exhibition of the traps and guns, which seemed to interest them. When they left, a feeling of satisfaction crept over me that my first entertainment of an Ikhwan Shaikh had been a success, as I had been under a certain amount of apprehension for some days previously. My first wash for seven days was delightful; hot water and soap never felt more luxurious. My face was burnt black, the skin was beginning to peel off my nose and cheeks, and my lips were badly cracked. This was due to the fierce dry winds, both cold and hot, in

addition to the afternoon sun. A plentiful application of vaseline prevented my face from getting very sore, but all the skin came off, and I was fated to lose it all again on the return journey to Hufuf.

Muhammad Hasan said that Rashid would like to give me the Saluki puppy if I would accept it, and suggested I could in return leave a present of rice in Hufuf; but he thought it better to wait a little and see if the dog was any good for Hares before deciding. He told me a quaint story of the maggots that live in a camel's head. I had noticed that every now and then a camel gave a sneeze and a large white maggot, probably of some parasitic fly, fell out on to the ground and in a most businesslike way buried itself in the sand. He now essayed to give the badawin version. They are placed there by Allah, and every camel's head is full of them, as it is only owing to their presence that the camel submits to man's service. Remove them, and the camel is quite unmanageable. He also gave the name of four tribes that occasionally raid the Al Murra; the Awamir, Saiar, Haraziz, and Duru. The first two, we know, come from the desert lying inland of Muscat, or, as these men say, near Jabal Akdhar. It is not easy to place the two latter, but their territory must evidently be further south towards the Hadhramaut hinterland, a country completely unknown, in which case they must pass through the Awamir territory to carry out the foray. He said the Awamir speak in a succession of grunts that no one but themselves can understand. The Al Murra understand and speak a little Arabic, but the Awamir do not.

At the evening meal another surprise awaited me, for a huge tray of rice arrived from the Amir with a whole goat on the top, in addition to a wooden spoon and quaint-shaped pot containing the water it was boiled in. The rice was pleasantly flavoured with pepper. I was secretly overjoyed at the prospect of a square meal, but told Hasan he ought not to have allowed the Amir to put himself to

so much trouble. The Arab, ever ready with a plausible excuse, had one at hand which effectually silenced further remonstrance. He said the Amir had wanted to follow the usual badawin custom and cook a young camel in my honour, while he, Muhammad Hasan, knowing my desire to avoid ceremony and entertainment, had been hard put to it to dissuade him, and had finally compromised on a goat, and thought he had merited praise rather than blame. The goat was fat, although how it found more than enough to keep itself alive was a mystery. Still, the fact promised well for our camels, and I hoped they would pick up a little condition during the few days of our stay.

[*February 18.*] There were a few Ravens stalking round the camp, and Khalid had the honour of being the only one to get a specimen. He came into the tent, borrowed the twelve-bore, and shot through a hole in the canvas. We got the camels and went for an hour or two among the date-palms, into the so-called gardens. It was a desolate and depressing scene of utter neglect, and even the birds had deserted it. There were no Bulbuls or Wren Warblers singing among the palms as at Hufuf. Saleh's running springs had been bewitched into stagnant pools with water three feet below the surface and a few yards across, mere circular basins with rather nasty-looking water in the bottom and sloping sides, making excellent drinking-pools for the camels, no doubt; nor was there any sign that the wells had ever been running streams. The lazy owners had not even troubled to keep the pools clear, and a great many were completely choked with tall reeds.

The Al Murra were going to fertilise the dates for the first time, doubtless under pressure from the Sultan. The blossom was just bursting from the heads of the male trees in white clusters, and last year's dead branches of bloom were still sticking out among the tangled growth. Saleh proudly took us to see his own "castle" and "garden," and I had to rebuke Mehdi for having an acute

fit of hysterics when we came in sight of it. It was nothing but one of the ruined mud-walled forts that had not been inhabited for 600 years. The garden was simply an area of the wilderness of date-palms. He also owned some of the water-holes, which, to his credit, were clear of reeds, and it gave him great pleasure to stand beside one of them to be photographed (Plate 46). There was nothing living to be seen beyond three kinds of Dragon-fly round the pool, one the greenish-yellow big kind that we had seen far out in the desert, a copper-coloured kind of smaller build that was common in Hufuf, and a green demoiselle. I was glad to have an opportunity of examining the ruins, as they were more widely known than many buildings of greater pretensions, and, moreover, were the home of the spirits famous throughout Arabia, that moan round the walls at night and appear to any badawin who is in ill health or of weak mind. The building was constructed of chalky sandstone, mud, gypsum and occasional blocks of stone; there was little left but the four crumbling walls, some eighteen feet high. It had no name, so I had to christen it Saleh's Castle to distinguish it from the others. The next one, not far away, he called Qasr al Khirba, meaning "the ruined castle," not a very distinctive title (Plate 47). It has some importance as being used as an Ikhwan mosque where the newly recruited brotherhood gather for prayers when the tribes are in residence. An attempt has been made to shade the worshippers in the inner quadrangle by a date-palm roof on palmwood pillars.

The builders of these mysterious dwellings were no thriftless badawin tribe, for in the inner court a row of holes was still visible which had held the floor-rafters of a second story, and a smaller square keep guarded the entrance where the door had been. The remains of a wall surrounded a spacious open courtyard containing a nearly dry water-hole similar to the others. The water-level of the whole of the north end of the palm area seemed to be the



46. JABRIN. A TYPICAL WELL IN THE OASIS, WITH "AQL" TREES. SALEH ON HIS ESTATE.



47. QASR AL KHIRBA, JABRIN.

same—about three feet below the surface—and probably a well could be dug anywhere with success. This fact accounted for the survival of the palms. On the other side there was the outline of a still more extensive enclosure, the circuit of the walls marked by buttresses of which only the foundations are left. This style of building is far beyond the conception or execution of any nomads. We could only find a few pieces of burnt pottery and ostrich shell that were no help in estimating the age, and there were no inscriptions. There were a few chalky sandstone mounds in a very decayed state, and the rising north wind was picking up the loose dust and blowing it in a white cloud across the palm clumps and the waste spaces between them. We saw no birds of any interest. There was one Stonechat, and in desperation I had a shot at it and missed, so we went back with an empty bag.

Since I was not feeling well and the country was not exhilarating, we returned early for a restful afternoon. The fact is that we had all been too hungry the day before and were now suffering from an excess of goat. I dosed the men all round with castor-oil and took some myself. About this time Saleh, who spent most of his spare time with his tribe, asked leave to bring one of his friends who was ill. He led him in and set him on the floor of the tent, and from his account he seemed to be suffering from dysentery, so he had a dose of castor-oil as well. He was a young man, prematurely aged, but handsomer even than the others of the tribe I had seen. I should say that the Al Murra were a good-looking race, not very tall, but well proportioned. The type of face reminded me of features to be seen on early Sumerian sculptures. It is not unreasonable to suppose that they are the representatives of this, the earliest civilisation. The conquests and passing of nations on the trade routes would leave them unaffected and unchanged in the fastnesses of their desert stronghold. The few women I saw were decidedly small and were wholly veiled. The men have been pagans to a very recent

period, but they have the natural good manners associated with old races and the uncultured pure-bred badawin in particular.

It was dark when my patient left, and my fame as a physician soon spread. Although I had explained that I was not a doctor and was only a hunting Sahib, another patient arrived. The new-comer had a child that had not walked from birth, and he wanted to know if I would see it. It was useless sending for it, so I handed the case over to Medhi, and I heard him say that it was the work of Allah and we had no right to interfere. One more unfortunate came to ask for something to cure his deafness, and Mehdi had to tell him we had no medicine for that. I was sorry that I had no spare medicine to relieve some of the sufferings of these simple folk. Their faith in the medical skill of the Englishman was touching.

[*February 19.*] It seemed advisable to have a quiet day. There was a long return march ahead, it was necessary to be fit when a start was made, and my own condition was not easy to diagnose. When I stooped I fell down, a puzzling symptom to explain in the case of a total abstainer. I had some Oxo cubes, which Mehdi boiled in water till they dissolved at double the strength recommended on the box. They made a good drink and were well worth the space they had occupied in the medicine-box. The theodolite was put up and observations on the sun were taken east of the meridian, on the meridian, and west of the meridian, which have fixed the latitude and longitude of Jabrin. Between times photographs were taken of the camp and of the Al Murra tents nearest the little building (Plate 42), and a distant view of one of the women riding forth on a donkey. There are several prominent kopjes to the north, Jabal Jawamir being the nearest, about three miles distant. These were connected up with bearings taken by prismatic compass, and the altitude of our camp was obtained by boiling-point thermometer. Saleh came into the tent and answered several questions as to the unknown

country to the south, about which I was anxious to hear. We began with the names mentioned to Philby by one of the Al Murra tribe and quoted in his *Heart of Arabia*. Al Khiran is in the Al Rimal, that is, south of Bir Aziz. It is ten days from Hufuf and is all sand-dunes like the Jafura. As far as he knew, no one had ever reached it direct from Jabrin, and the section of the Al Murra who graze there travel direct from the Hasa eastward of our course at the same time that his own tribe come south to Jabrin, following the route our party had taken.

Haraisan he called a *jabal*, lying eastward of our position, on the other side of the Dahana sands and southward of Riyadh. Al Khin is a well close to Jabrin, half a day on a camel to the east of the palm tract, and there are a few palms there. I was able to see Al Khin later and confirm his account. He went on to tell me that the sands of Al Rimal begin south of Jabrin and you can march for a month in them. I asked where you would be at the end of that month, and he said, "Najran," but he had never been there.

Saleh was beginning to feel that the reputation of his country had suffered, as the others were beginning to laugh at him and remind him of his glowing descriptions of Jabrin over the camp fires on the way down. He had set twelve traps and borrowed my twelve-bore and some cartridges to start out on foot to the palm tract in a very unpleasant sandstorm. He had never seen a breech-loading shot-gun before, but had mastered the mechanism, and was like a child with a new toy when allowed to carry it. Mehdi's eyes were very bad—yesterday's sandstorm irritated them—but bathing with warm salt water seemed to relieve them somewhat.

Saleh returned after six hours with six birds for an expenditure of six cartridges. He said he was walking all the time, and as it was 111° in the sun, this showed a fine endurance. He also said that he would have got more, but it was impossible to see much ahead owing to the

blowing sand, and the birds were all sheltering in cover. The specimens were unfortunately knocked about owing to his inexperience in judging the distance, and there was little of interest, as five of them were Wheatears. However, I was glad to find the sixth a Desert Warbler (*Sylvia nana*); although several had been seen, I wanted one for identification. He also brought in a bird in one of the traps. I was feeling better and supplemented the evening meal of boiled rice and dates with a pint of Oxo and a peg of brandy.

[February 20.] The permanent well by the camp was a circular shaft cut into chalky sandstone. The water was about forty feet down and seemed to be very good. We set forth to see the southern limits of the palm tract. It made rather a wide circuit for the two Ikhwan who had to spy out the land first, and we arranged to meet them and hear their report at the Amir's garden, to save time. The Amir's property is also merely an allotment of the palm area, containing some of the best trees and situated approximately in the centre. I had asked Muhammad Hasan about getting a photograph of some of the tribesmen, and he suggested that, as they would probably object, our best chance would be to get these two men when we met, as there would be no one else to see them. Before they realised what I was up to, they were standing for their portrait, but I had to cause a little delay in getting them in front of a dark palm for a background, as the white ground would have spoilt the picture. It was then that they began to look suspicious until Muhammad Hasan, who thoroughly entered into the plot, gave them confidence by standing beside them and placing Saleh there too. Even then they were not quite happy. I heard one say, "Has the Imam (the Sultan) ever been taken?" and Muhammad answered more promptly than truthfully, "Yes, he often has his photograph taken," which just kept things going till the operation was over (Plate 48). They were very different from town Arabs or even badawin who



48. SALIH MUHAMMAD HASAN TWO AT MUKRA IKHWAN SATUKI.



49. DANGEROUS SUBSIDENCES CALLED "ZAWARIT," S. JABRIN. 'SHINAN' BUSHES.

have access to towns, for these love posing in front of a camera. After I had proposed to Muhammad Hasan that I should take a portrait of the Amir, the latter avoided me during the hours of daylight until I was mounting to depart, when he came to say good-bye.

The southern part of the oasis is more derelict even than the north. If the northern may be called "god-forsaken," the rest may be described as "god-accursed," and many are the dead poles standing erect like masts, that once were date trees (Plate 51); even the desert bushes in among them are more often dead than alive. The water seemed to have dried up, and much of the land was salt-encrusted. We passed no wells or water-holes then, but a strange sinking of the subsoil had left circular pits about nine feet in diameter, which they call *zawarit* (Plate 49). These are said to be dangerous to camels, for if the clumsy beasts get even one leg in they cannot get out, and die before they are found. After rains these holes are said to be soft and filled with drainage water, but the bottom was hard when I saw them, and none was more than four to six feet deep.

We reached the end of the big palm tract about six miles south of the northern margin. After this there were merely patches, a few isolated tolls, a mile or two apart, one of which was Al Khin mentioned above. South of this there was bare sandstone with a few kopjes 100 to 200 feet above the plain, and after that, for some 800 miles, the Al Rimal sands. I wanted to get on a dominating hill to look round and take bearings, so we turned eastward and climbed to the top of Jabal Jabrin al Wasti, which looked as if it would serve the purpose (Plate 52). When I asked Saleh the name, he called it Jabal Jabrin, and I pointed out that this was the third different hill to which he had given the same name. He knew that, was the reply, but that was how they named them. "Look here!" I said, in desperation, "supposing you found a camel on this hill that could not get up, and you wanted to tell the Amir, how would you explain where it was? If you said, 'Jabal

Jabrin,' he might send his men to the first Jabal Jabrin you showed me, ten miles from here, and the camel would die." "Oh no," he said, brightly, "I should say Jabal Jabrin al Wasti." "All right," I said, "that is just what I have been asking you for, and in future always remember the dying camel when I ask you the name of a hill."

I got the bearing on Jabal Jawamir, which I knew well by now as lying north of our camp, as well as on all the most prominent hills to my south, but was disappointed on the following day, when I ascended Jabal Jawamir and wanted a back-bearing, to find that Jabrin al Wasti was not distinguishable among several others in the haze.

There was very little life to be seen. The Desert Warbler was the most common bird and generally gave a long chase from bush to bush before it could be secured. They were in pairs, and as the cocks were often displaying and occasionally bursting into song, they were quite possibly intending to breed there; on the other hand, they may only have been there for the winter. A pair of Great Grey Shrikes were certainly preparing to breed. We came unexpectedly on a small party of Spotted Sand-grouse (*Pterocles senegallus*), looking like a collection of stones. Khalid, who first saw them, had the right of the shot and took my gun. We easily came within range on the camels, of which they took no notice. He then slipped to the ground and had a shot into the brown, but missed them, and had to submit to a running fire of derision from the other men for the rest of the day. It was a disappointment, for these were the only Sand-grouse about, and it seemed unlikely that we should get a chance of identifying them.

A total eclipse of the moon was prophesied for that evening in my *Nautical Almanack*. Not being sure how these phenomena affected the Ikhwan, I had been undecided whether to advertise the fact or keep it dark, and had wondered whether there was any possibility of my presence being held responsible. All things considered, I thought

it best to say nothing. We returned to find that Saud had tea ready, but soon after it had been handed round I heard a terrible noise, and running from the tent I found him rolling on the ground with abdominal pains, emitting such agonised sighs and moans that I had visions of death and a funeral. I made him drink a dose of castor-oil, and we wrapped him up in rugs near the fire. When the first shadow of the eclipse stole across the moon, the moaning ceased, and I found my camp deserted but for Mehdi, who said that the invalid had gone off with the others to the Amir, who was holding a special service of intercession that the moon might come out of the shade. This must have been a tax on the resources of the newly-appointed Ikhwan Amir, for he had only just completed the ordinary evening prayers, and was now unexpectedly called upon to lead the service for an extra hour or more. Nevertheless, I could hear from the responses of the congregation which were wafted across on the breeze that he was maintaining his position with ease and with ultimate success, for after an hour of totality the moon emerged. I sat on a box and watched the whole eclipse. Thanks to the unrestricted sky and the clearer atmosphere, a more wonderful view of the spectacle has probably never been enjoyed. When the planet rose, there was about half a moon left and it looked much as it appears during the last quarter. As the whole disc became involved in shadow, it turned into a red-hot ball about half as big again as its usual size. It seemed to grow to a white heat as the sun's rays touched the lower edge. The custom of firing guns and beating tins prevalent in Arab towns during an eclipse (Arabic, *meksuf*) is apparently not followed in the desert. Considering that the badawin have no means of knowing the phenomenon is not supernatural, their manner of spending the time of supposed danger seems very fitting and dignified. Incidentally the eclipse effected a permanent cure of Saud's complaint. He returned to the coffee-cups after the prayers, and we heard no more about it.

I missed the cry of the Jackals in Jabrin. There were none. We seemed to have left them behind in Hufuf, which suggests that even a Jackal has his limits of discomfort and bare living.

[*February 21.*] Our objective on this day was the sandstone range three miles to our north, called Jabal Jawamir (Plates 53 and 54). I hoped to find a fauna similar to that of the bare isolated hills round Hufuf, and thought we might see the Desert Eagle-Owl, Desert Lark and Pallid Crag Martin once more, but I was to be disappointed. To give our riding-camels as much rest as possible, we took three baggage-camels, and ere we returned both Muhammad Hasan and Saleh had lost their tempers with them. This so rarely happened that I was pleased to find at last the measure of an Arab's patience with the most aggravating brute in creation. My method of travel was not suited to the camels' ideas. Had we mounted at the camp and dismounted at the hill, all would have been well; but they got more and more disgruntled at my frequent stops to catch a lizard, shoot a bird, or pick a botanical specimen, until they ultimately showed their displeasure by standing up when they were wanted to sit down, by sitting down in and out of season, or by taking any opportunity to dash off in the direction of camp. One dragged Saleh, hanging on the other end of the head-rope, quite 500 yards at full gallop, but he held on and eventually brought it to its knees. The saddle was by that time on the verge of slipping off, and the animal struggled so furiously that Muhammad Hasan eventually hung on to its nose with his teeth, a living twitch that seemed to be as effectual as the other kind used on an unruly horse, but requiring a fine set of teeth. Saleh's camel, not to be outdone, went down several times and tried to roll with him. He jumped nimbly off and stood ready, and sprang into the saddle as it rose. During all these exhibitions of ill-temper there was no attempt to bite, although the bellowing from the



50 S JABRIN "SAWAD" BUSHES



51 DYING DATE PALMS AT SOUTH END OF THE OASIS, JABRIN



52. S JABRIN VIEW FROM JABAL JABRIN AL WASTI, LOOKING OVER THE GREAT SOUTH DESERT

wide-open mouths was incessant and the beasts could have bitten had they wished.

We eventually reached the base of the hill, hobbled the camels lightly, and left them while we clambered up the rocks to the summit. The whole place seemed to be tenanted only by one Merlin that flew out of a cliff, albeit there were footmarks of Hyænas in some of the caves. If there was not much to be done in the way of collecting, there was plenty of geographical work in front of me, as we had before us a good panorama of the entire Jabrin basin, from the hills far to the north near Jabal Aquila to those to the far south on which I had got bearings the day before, with the black patch that was the palm area lying between. Having the correct position of the camp already fixed, I was able to link these points up to it and obtain a very satisfactory spider's-web of angles for the map of the whole area. In addition I read the aneroid barometer at the top and bottom of the hill to ascertain its height. A long range of hills called Jabal Umm Hadiya comprised the whole western horizon at a distance of about eight miles. Saleh said that behind them there was another range and yet another, and then the sands of the Al Rimal that run up northwards to join those of the Dahana. He pointed the direction that he would take to go to Najran, and I took a bearing on his arm. He said that they only did the journey in years of exceptional winter rains. The winter quarters of the Al Murra were in the neighbourhood of Juda, north of the Hufuf-Riyadh road, and up to Rubia.

We collected geological specimens of the chalky sandstone rubble and hacked some off the cliff at the top, together with pieces of a bright pink sandstone stratum from below. On the way home a sample of blue-grey material was added from an old excavation near a dry well. Here also we came upon our only piece of granite. It seemed a strange place in which to find it, as all the country is sandstone, and when I looked into the

matter in England, the nearest match for it seemed to my inexperienced eye to be the Assuan red granite used for the ancient Egyptian statues. I hoped to be able to account for the presence of the piece I found by the suggestion that it had some connection with the old caravan routes between Gerra and Egypt, and was possibly a chip that had fallen from a bigger block on its way to Sumeria or Babylonia; but Mr. Campbell Smith does not agree with this, as will be seen in Appendix VII. Saleh told me of a place called Magainma, six days' march to the south of Jabrin in the middle of the Al Rimal sands. The Jabir branch of the Al Murra go there in years of exceptional rain, as on these occasions they are able to find water in some very deep wells. There is good water at a depth of 35 *ba* (150 to 200 feet); a *ba* is the distance between the tips of the fingers of both outstretched arms. The tribes have to take long ropes with them, and camels draw the water. According to Saleh the Beni Hallal, a mythical people of ancient times, dug the wells. When there is water in the wells the Al Murra camels can graze the land that lies in the centre of the Great South Desert. I then asked him to show me the direction in which it lay, and he said the route would pass close to Jabal Madhbar Janub, one of the southerly hills we could see, which gave a bearing of 170°. The name Magainma has never been heard of before by European travellers, and seems to have little resemblance to any Arabic word. The name does, however, suggest the Magan mentioned in Sumerian inscriptions, whence the ancient kings of Sumer and Akkad obtained their diorite, a black granite that found much favour in those days for statues.

We learn from L. W. King¹ that Naram-Sin, King of Akkad, recorded on the base of a diorite statue of himself that he conquered Magan and slew its prince; he also says: "The precise position of the land of Magan is still unsettled, some setting it in the Sinaitic peninsula, others

¹ *A History of Sumer and Akkad*, L. W. King.

regarding it as a portion of Eastern Arabia. In favour of the latter view it may be noted that from Southern Babylonia it would be easy of access by way of the Persian Gulf, and the transport of heavy blocks of diorite, which Naram-Sin, and at a rather later period Gudea, brought from Magan, would be more easily effected by water than overland. In that case Naram-Sin's invasion of Magan was in direct continuation of Shar-Gani-Sharri's (his predecessor) policy of extending his empire southwards to include the shores of the Persian Gulf." This statue, Naram-Sin records, "was fashioned from diorite brought to Akkad for that purpose from the mountains of Magan." And from the same volume: "Gudea¹ definitely states that he fetched the diorite for his series of large statues from Magan." George Smith of the British Museum has translated the Sumerian name as Maganna, and here the resemblance to the Arab pronunciation of Magainma is even more remarkable. He says: "Sargon was succeeded by his son Naram-Sin, who conquered the kingdom of Apirak and later on the land of Maganna or the 'Ship Region.' This name Maganna is also applied to Egypt in later times, but it is more probable that the Maganna of Naram-Sin was a region of the Persian Gulf."²

When I mentioned the similarity of the two names, Magan and Magainma, Dr. H. R. Hall, of the British Museum, said that a point against the idea of any connection between them was that the most recent interpretation of Magan is "the place where boats go to." This certainly does not suggest Magainma in the centre of the desert, but the ancients often gave the name of the capital to the port. The question makes an attractive subject for investigation, and as such I present it. There is not enough evidence in the case to allow one to do more than suggest the theory.

¹ Gudea was Patesi or Sumerian King-priest at Laqash, now called Tello, near Shattrah, Iraq.

² "History of Babylonia," by the late George Smith, in *Ancient History from the Monuments*, p. 80, ed. by the Rev. A. H. Sayce.

Saleh went on to describe the movements of the Al Murra. At the end of May they move south to Jabrin, their stay covering the period when the dates are ripe, and they all help with the harvest. During June, July and August they remain either at Jabrin or further south around Magainma, and then they return north of Hasa again for the winter.

There was a slight depression in the crown of Jabal Jawamir which was so well bushed that it must by some means collect more water than the flat country around the base, whereas from its position it might be expected to be as dry as a lime-kiln. There were several of the acacia *Salam*, most frequently seen in dry *wadi* beds and hollows, and its appearance in a flourishing condition on the top of the hill was no small surprise (Plate 53).

Finding that Saleh and I were making a long stay, Muhammad Hasan had preceded us in the descent to look after the camels, and when we reached the bottom neither man nor animals could be seen. Shouting only produced an echo, and after half an hour's wait on a rock we started off to investigate. We could see the plain almost the whole way back to camp, and there was no sign of the camels there. I had neglected my usual precaution and had left my water-bottle on the saddle, and now the sun came down pitilessly on the bare hillside, creating a thirst that made me painfully aware of my carelessness. Saleh presently found the tracks of the camels making more or less in the direction of home, and got as excited as a bloodhound on a warm trail, calling to me to come with him and follow them. I was thirsty and tired and not at all pleased at the prospect of walking three miles back to camp, and the idea of following the tracks of a camel which might lead us anywhere appealed to me still less. I pulled him up sharply before he got out of hearing by saying that the camels could go to hell, I was going to make a bee-line for home, and he was to come with me. All his tracking instinct was tingling in his veins, and he was like one

52



53 JABAL JAWAMIR, JABRIN, AND "SAI AM" IRIS



54 THE SOUTH SLOPE OF JABAL JAWAMIR, JABRIN, CHALKY SANDSTONE CRAGS

possessed, but my tone and expressions made him halt and return, and we sat down once more to search the plain with field-glasses. We had not waited long when a distant shout came round the crags, apparently from the hill-top. I fired a cartridge and Saleh shouted ; we received nothing but echoes at first, but later got a faint reply. This was reassuring, as we then knew that Muhammad was somewhere in the hills. At last he appeared, and we learnt that he had found the camels wandering far to the north on the other side of the hills, and had brought them in and tied them to a rock there. On returning to find us, he had seen and heard nothing until, after an anxious time, my shot had given him our direction. Very much relieved at the turn events had taken, we went round the eastern bluff of the hills and remounted our wayward beasts. The incident was responsible for adding another bird to my list. A flock of seven Rock-Doves came and settled on the top of a high cliff, but were so wild that we could not even get within rifle-shot of them and did not secure a specimen.

An hour after sunset I wrote in my diary these words : " It is difficult to realise as I write this that I am in the middle of Arabia. My chair is a saddle-bag just outside my tent. The evening meal is finished. It is brought immediately after the sunset prayer, plain fare of hot boiled rice and dates out of a goat-skin brought from Hasa. Behind Saud with the rice comes the Saluki, Najman (Two Stars, a most appropriate name), with quiet dignity ; it stalks into the tent and sits down at a respectful distance ; there is none of the vulgar familiarity an ordinary dog would show when begging for a meal. Usually the hind-legs continue to stand while the long fore-legs are bent back in a kneeling position that I have never seen adopted by any other dog. The air of supplication is perfect and the appeal irresistible. When I did not feed it, it quietly left the tent, following the tray with the same dignified air. The men have adopted it and have decided that it is to accompany us to Hufuf. The moon, full and

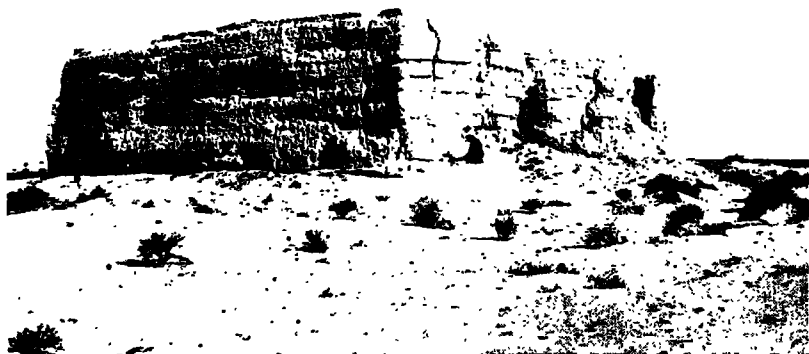
in eclipse only yesterday, is now rising like a great golden egg, the oval shape being produced by refraction. Orion and Sirius are right overhead, and Canopus is about 25° up in the southern sky. The men are gathered round the camp fire, chatting incessantly, and beyond this not a single sound breaks the stillness; dead silence reigns. I catch a pale cream-coloured Praying Mantis with a marvellous coat of desert colouring. It is put into an envelope. The lamp is then invaded by a swarm of small moths dancing a whirligig in their persistent attempt to immolate themselves. Why do they do it? Some crawl through the air-holes and expire in triumph. I put some in an envelope and hope the authorities at South Kensington will some day tell me what they are, and why so suicidal." They have since been identified by Mr. Tams of the British Museum (Natural History) as *Hetenographis ulvmarginella*, the usual locality of the type being Disa, north of Baroda, India.

Soon after the above notes in the diary were written, the moths swarmed through the small air-perforations of the lamp and reached the flame in such numbers as to extinguish the light.

[February 22.] The shade temperature at sunrise was 55° , and in the tent at local noon 90° , a difference of 35° in six hours in the shade. In the sun at noon an extra 20° would have been registered, so that the fauna and flora and mankind had to resist a difference of no less than 55° during the day. I was wearing winter woollen drawers and vest and a thin woollen shirt. It was hot in the middle of the day, but hitherto not inconveniently so, and I should have found cotton underclothing too cold in the morning and evening if the change had been made. In addition to these I wore a thin Norfolk jacket, chiefly for the sake of the pockets, and thin flannel trousers. The Arab cloak and head-dress covered the whole, but it was necessary to cast the cloak for fast work among the crags. There was a south wind, and a white dust-storm could be seen



55. QASR TAWAIRIF, N. JABRIN, SHOWING LARGE SQUARE
MUD BRICKS. MEHDI DIGGING FOR "TREASURE."



56. QASR TAWAIRIF, N. JABRIN.

blowing among the palms. Luckily my day's work lay this side of them, as we proposed to visit a ruined castle called Qasr Tawairif, about twenty minutes' walk from the well, to dig for buried treasure and investigate a report that an Owl lived there (Plates 55, 56). We found nothing that has assisted to date the building. There was a little broken pottery made of red clay that was quite characterless. Mehdi dug several trenches down two or three feet among the foundations without finding anything. The castle was substantially built and had resisted decay more than the others. The interior was twenty-five yards square, and the walls were now eighteen feet high, the bases eight feet thick. The building material was large square blocks of sun-dried mud. A row of holes marked the line of the joists of a wooden floor.

Although the Owl was not at home, the size of the castings of indigestible portions of insects and animals left little doubt that it was the common Barn-Owl, which seems to be as much at home in these wastes as it is in an English belfry. Saleh had some success with the traps and brought in two beautiful pale cream-coloured Jirds (*Meriones arimalius*) that seemed certain to be new. As they were caught in daylight, we had established the fact that they are diurnal feeders. Apparently certain kinds of the genus *Meriones* are strictly diurnal, and other nocturnal, although previously they were all considered as being night animals. This subject is more fully treated in Appendix I.

We made our preparations for leaving on the following day. Realising that we cut it too fine before, Muhammad Hasan borrowed an extra water-skin. We heard that the Amir had lost a lot of camels. They came in as usual to drink the day we arrived, and had not been seen since; search parties were out in all directions and there was much ado in the camp. The badawin spends much of his time looking for lost camels, indifferent to the fact that a few precautions would obviate all this trouble. To add to the Amir's difficulties, the female date-palms were all bursting

into flower at once and required artificial fertilisation, and he could not make up his mind whether to dissipate his forces in the camel-hunt and let the dates go, or concentrate on the dates and leave Allah to guide the camels back to camp.

Muhammad Hasan said that the Ikhwan element had been a little difficult, and had asked the Amir why an infidel should be allowed to come into their territory. He added that two years ago they were pagans without any religion or marriage ceremony. Some of them used to pray, or at least go through the motions of Muslim prayers, but if you stood beside them you could tell that they were only mumbling, not knowing the correct words. The Sultan was having them instructed by the Wahhabi deacons, and marriage ceremonies were now performed by the Amir.

I asked whether I ought to return the Amir's call and say good-bye, but Muhammad Hasan said that it would be unnecessary, he would come and see me. This suited me quite as well, and probably it would have been difficult for me to go into a tent crowded with the more morose members of his community. I handed Muhammad Hasan ten rupees (13s. 4d.) each for the men who had acted as scouts, being a little puzzled as to what was expected of me, and intending not to overdo it. At the same time I told him I intended to leave a present of rice for the Amir with the Qusaiba family on my return to Hufuf, and some for Rashid ibn Daleh in return for the Saluki, a very happy idea for getting over the problem of giving presents, which is always tiresome and uncomfortable.

The Amir had the evening meal with my party first, and joined me for tea and coffee and incense. We got through the various inquiries after each other's health just in time for him to accomplish the purpose of his visit before he left. I thanked him for all the arrangements he had made for my safety, and he said his health had been improved by the news that I had had good hunting (pre-

sumably in Saleh's account of our excursions). It had all been a great pleasure to him. He was sorry he had not been able to send me any Jabrin dates to taste; fodder being scarce owing to drought, his animals had eaten them all. I told him I had left ten rupees for each of his men with Muhammad Hasan, partly to make sure that the latter gentleman did not forget to part with them. On hearing the amount, the Amir gave a gasp, and to this day I do not know whether he was choking at the munificence or snorting with indignation at the meanness of the sum, or merely had hiccough. Muhammad Hasan placed his own interpretation on it with the explanation that I was only a "Sahib al ghunus" (hunter) and therefore had not a lot of money to give away. He felt it his duty to ensure that this our last conversation should be a success, and wore a very worried look during our parting sentences. After the Amir and I had said "Anna mamnunin" several times, as is customary (literally, "I am very grateful," "And I am very grateful," oft reiterated on both sides), Hasan in a hoarse whisper said, "Now say 'Anna mamnunin,'" so I repeated it once more. I was really grateful to Shaikh Hamad, for everything had gone off smoothly, and I fully realised the uneasiness of the man responsible for an infidel in an Ikhwan settlement. Had anything happened to me, his own future would have been seriously affected.

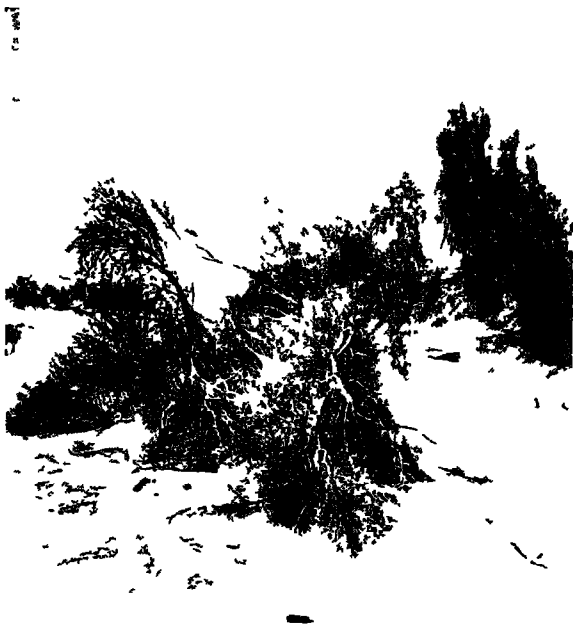
All the people, the Amir included, corroborated the story of the bad reputation of the oasis for fever. It was therefore strange that I had been as unsuccessful as I was at Hufuf in seeing an *anopheles* mosquito. I had only heard one that came into my tent on my last night in Jabrin, and I tried in vain to secure it. From the glimpse I caught, it was small; it hummed loudly, like the Hufuf specimen, and I have little doubt that it was only *Culex fatigans*, a non-carrier of malaria.

CHAPTER XVI

FROM JABRIN TO HUFUF

[*February 23.*] To everybody's delight we departed from Jabrin. I had insisted on a short march in order to camp in the sandhills in Jabal Aqla and set traps for the Jirds. On the journey down collecting had been sacrificed to mapping, and now that the 150 miles of country had been well plotted our efforts could be concentrated on the mammals. The Amir came to see us off, and just before I mounted, I went to shake hands. He gave me a much colder farewell in the open than in the tent, possibly playing to the Ikhwan "gallery" which was looking on. We left camp by a somewhat better road than that by which we came, and kept to the track taken by the great tribe on its exodus, to which the well-trodden camel-paths bore witness. The land was mostly gravel plain, hard enough for any motor-car; but the occasional belts of soft sand-dunes would stop all wheels unless a way could be found round them. Such were the dunes covered with *Gadha* bushes for which we were steering (Plate 57).

We camped there with all the afternoon before us. There were plenty of burrows under every bush, and we had a dozen traps out. The men were anxious to find a Hare to test the Saluki, and I wandered off with my gun in another direction to find out something about the habits of the Jirds by quietly watching behind some well-bushed dunes. They soon appeared and began to scamper about in the sun. Their pale sandy coats made them difficult to distinguish from the sand around until they moved. The slightest noise on my part sent them scampering to their holes, and I became aware



57 "GADHA" BUSHES IN SAND DUNES, JABRIN, WITH
BURROWS OF THE NEW JIRD



58 THE SALUKI WITH A CAPTURED HARE, JAIURA DESERT.

of a ticking noise which they made as a danger-signal, as if a man was marking seconds with two sticks. All the while the noise goes on, not a Jird will show itself. I determined to shoot one or two in case the traps did not secure any. The voices of the hare-hunters could be heard in the distance. They had evidently found one and were drawing nearer, and I began to regret my rashness in not saying where I would be, and momentarily expected a stray bullet to come my way. My gun was loaded with dust-shot ready for a close shot at a Jird when a Hare ran past me. In self-protection I gave it both barrels, thinking that by ending the hunt I might save myself the trouble of extracting a bullet from my leg, but the quarry went on as if untouched, and I sought safety as low as possible in the trough of the dunes. Excited voices drew nearer, and the men at last appeared, Saleh leading, following the tracks with the zeal of a beagle. The Saluki was held in reserve, and when the prey came into view the dog took up the chase till the Hare went into cover or behind a dune, when the Saluki, having no idea of scent, was useless; then Saleh's unerring eyes traced out the line once more. Waiting till the muzzles of the rifles had safely passed, I made my presence known and told them I had seen the Hare. A moment later they found it lying where I had shot it without realising that I had done so.

There was much jubilation, and as it was a good specimen Medhi rescued it for the collection before its throat could be cut and the skin ruined, I laughingly pointing out that I should be able to eat it, and they, being good Muslims, would be denied the feast. They got over the difficulty by quoting a clause in the Quran, imaginary or otherwise, that animals killed in the chase need not be *hallaed*, i.e. have the throat cut in the name of Allah the Merciful. Saleh seemed disappointed at the premature termination of the hunt and got in a little more tracking by following the footmarks backwards to see whether I had made good shots or not. There was the whole story

imprinted on the sand, and as both shots made a circle through the centre of which ran the footprints of the Hare, he was very favourably impressed, all the more so as a shot-gun and its operation were new to him. I did not point out that the story written on the sands need not be an unimpeachable witness; for I might have shot behind the Hare and missed it entirely and still have made the same pattern on each side of its track. On our return to the camp we found several Jirds, and Mehdi was kept busy skinning our captures. One of them had been finished and well dosed with arsenical soap, and I had written the particulars and measurements on the label and tied it on, when, with the same dignified air that characterised his every movement, the Saluki swallowed the whole thing. Strange to say, neither the arsenic, the label, nor the string seemed to disagree with him, although we gave him up for lost. Since there were plenty of other specimens, the loss of one was not serious, and we even had to preserve two in spirit.

[*February 24.*] We were away early as Muhammad Hasan seemed to scent danger and was anxious to get out of the Jabrin area as soon as possible. He thought we ought to make Wadi Sahba before night and camp there, as the valley would screen us better than the plain. Saleh was telling me how the Arabian ostrich used to visit the Jabrin desert in the days of his grandfather, who was the last of the Al Murra to kill one. The story came to an abrupt termination, for he suddenly slipped from his camel and began dancing round in a wide circle, prodding the ground with his big toe. I was quite mystified. The prancing ceased, and he began scratching at the ground with his hands like a terrier at a rat-hole, while Muhammad Hasan, who had also dismounted, began scratching up the ground near me. The word he muttered, "Jerboa," did not enlighten me, but I soon found that we had almost stepped on a Jerboa's burrow, and the tenant was at home, for it had stopped up the entrance from inside with fine

sand and gravel. It is this flat ground, composed of fine stones and sand, that they generally choose. Having closed their front door, they dig a hole some twenty yards long. The front door is difficult to see (Plates 59 and 61); the back door cannot be detected, for it is left unopened just below the surface. As soon as a fox or man commences to dig at the front door, the Jerboa opens the other exit and escapes either with a useful start or quite unnoticed; in the latter case the excavator would be left to finish the task alone. Saleh's first aim was therefore to find the other end of the hole, and both men were now digging towards each other, confident that they had the little animal somewhere between them. Their expression was comical indeed when they met in the middle and there was nothing. A short consultation took place, and they all began running their hands along the side, where a softer patch denoted that the Jerboa, baulked of its original intention of bolting, had buried itself in the side of the tunnel, throwing up the sand to cover its retreat. This ruse would probably have defeated a fox, which would have followed the straight hole to the end and left the occupant well buried in the débris behind. As things were, the men soon had it in their grasp. It was a paler specimen than any I had seen before, and I had great hopes that it would prove a new species, as it eventually turned out to be. On comparing it with other skins in the British Museum collection, its pale colouring was quite as remarkable as it had appeared in the desert. The nearest approach to it in colour was a Jerboa from Aïr in the Western Sahara.

It was a long steady pull up to the top of Jabal Aqula, and before we went over the brow on to the gravel plain and lost sight of the Jabrin basin for ever, I sat down on a mound to take one more set of compass bearings on all the visible hills, most of the more prominent being now familiar to me. We had resumed the march, but were not yet over the brow, when we came upon the tracks of twenty-four

camels, crossing our path at right angles—that is, they had travelled from east to west along the ridge, from which their riders would command a good view of the entire Jabrin depression. Saleh was soon on the ground examining the footprints, and I had little doubt from his serious expression what they were. It was indeed the track of a strong party of the dreaded Awamir raiders, and in a quarter of an hour their whole history was revealed to us. We came upon the tracks of our own party going to Jabrin, and the Awamir tracks passing over them showed that they had appeared the day after us. As Muhammad Hasan explained, if we had been a day later they would have seen our evening camp (he politely omitted to mention my lamp) just below the hill and would have made a night attack in an attempt to get our camels. Twenty-four camels might mean anything up to forty-eight men, as they ride two on a camel, but they thought a total of twenty-four men more likely on a long waterless raid. It was possible that the Awamir, having seen our tracks and read them, would have visualised an armed party coming from Hasa with eleven camels and perhaps twenty-two men, and considering the combat likely to be too even to be amusing, would have returned hastily home. We looked carefully but in vain for any sign of their return as we hurried on to regain the rest of our party, who were now several miles ahead over the horizon. The tracks of a raiding party or *gom*, as it is called, can be distinguished by the lighter tread of its camels. Laden camels go deeper into the sand, and the *dhaluls*, or thoroughbred camels, used for fast and illicit work of this kind have smaller feet than the great pads of the peaceful tribal stock. Saleh also knew their intentions by their formation; that is, they were in three rows or strings with eight beasts in each, one behind the other, and by the footprints he knew that they were marching fast. He then burst forth into a torrent of bravado, the theme of which was that each one of our four rifles was worth five of theirs; but Muhammad Hasan was in no

mood to hear much of that and stopped him, and we rode along in thoughtful silence until we caught up the rest of the caravan. We had coffee in a patch of *Arfaj* bushes and spent the rest of the day on the featureless gravel.

After about fifteen miles in a pitiless sun the Saluki looked as if he was getting tired, and Mehdi wanted to pick him up and give him a ride; but Saleh told a long story of how Salukis never want rest or water, as it is their pride to drink and rest only when they get into camp at night. This effectually silenced him and me, for I was about to suggest that the dog should drink a little. The poor beast used to trot ahead, find the shade of a bush (no bushes were more than eighteen inches high), and having scratched away the warm top layer of sand, would sit down in the cool sand underneath and wait till we were half a mile ahead; then he would canter up. He did not seem to be enjoying himself as much as he was supposed to be doing, but I said nothing. At last he sat himself down before us, threw his long nose and neck into the air, and gave vent to a most piteous howl right in front of Saleh. This was too much for him. He couched his camel and, taking the water-skin with which he had been entrusted, began to pour the liquid into the hollow of a leather sheet laid on the ground, sprinkling the thirsty sand with our precious water at the same time. The dog drank deep and long, and without saying a word Saleh picked him up and gave him into the care of one of the men riding on the baggage-camels. After that the dog always rode for part of the day. Nevertheless, I feel sure that if Saleh were asked if a Saluki drinks on the march, he would reply, "Oh no, it is their pride not to drink or rest till they reach camp in the evening." Another trick for keeping cool practised by the dog during our half-hour halts, was again to select the shade of the thickest bush and scratch off the top layer; then squatting down in quite a human attitude, with his hind legs sticking out in front, he would throw up the sand against his body until he was half buried in cool sand.

There were no birds to be seen, but we passed several big holes of the *Thub* or Spiny-tailed Lizard, and at last found one far from its home. All the badawin were off their camels in a twinkling and were after it as hard as they could run, while the great Lizard kept ahead for a long time, with tail erect and wobbling gait, looking much like a young alligator. They just managed to catch it and stun it with a stick, and its throat was cut with a pious exclamation of "Allah Akbar !"

Wadi Sahba was reached an hour before sunset, and we camped in much the same position as before. In approaching the neighbourhood I had been ready to note the first fall in the land towards the Wadi in order to try to fix the watershed. At last there was an undoubted gradient, and as I took out my notebook and wrote down the time, I saw that Saud, who had ridden ahead, was lighting a fire, and realised that I was on the point of descending the banks of the Wadi itself.

Muhammad Hasan's nerves were all on edge, and he wanted me not to light my lamp at all. There were some animals to skin and at least an hour's writing up of the diary and notes to be done; so we concluded a bargain that there was to be an hour's delay the following morning to catch up the work by daylight.

[*February 25.*] The men spent a very anxious night and hardly slept at all. Two of them were patrolling the country around at intervals until daybreak. Since we had not seen anything to denote their return, it was possible the marauding band might run into us. It was fortunate that all the necessary star-work had been accomplished on the journey southward, for it would have been out of the question on our return. The *Arfaj* bushes in the Wadi had made much growth since we were here before, and the grazing was good. The camels got in two hours' feeding during the evening, most of it after dark, with an hour in the morning by way of an extra. This is not sufficient time to satisfy them even if vegetation is plentiful,

but it stays the pangs of hunger. They manage to swallow without inconvenience branches of the acacia *Salam* in spite of its most prodigious and unyielding thorns, and the thorns are returned later up the throat when the cud is chewed.

The men occupied the extra hour in the hurried baking of some bread-cakes buried in the sand under the fire. Coarse wheat flour was mixed with fat to make the dough. They seemed a little indigestible, but we ate them with enjoyment and without ill effects. My appetite was by now not of the jaded kind that requires the assistance of harmonious drapery and soft music. Nothing had come amiss so far except the Spiny-tailed Lizard. This had been roasted, and was considered by the men a great delicacy. They gave me the best joints, but it tasted exactly as a lizard might be expected to taste, and I should have to be starving before I devoured any more. I walked over towards the south bank, where the old river had seemed to be clear of loose sand. We were told by Saleh to look out for moving stones, as we were coming into the area in which they might be expected.

Our weary march over the gravel plain was enlivened by the best coursing it has ever been my lot to witness. It was entirely Hare *versus* Saluki, for the men, although they excitedly whacked at their camels, were hopelessly left behind and had to be content with a very fine view of the chase. The first Hare started near us, and as everyone turned his back on her to look for the Saluki, she squatted after running 200 yards, and no one knew in the least where she was. Some held that she had gone to ground, and others that she had disappeared over the horizon. We spread out to look for her, and this time she jumped up close to the dog and kept ahead of him for 500 yards. Amid the diligent thumping on the camels' sides, everyone could be heard accusing everyone else of having given the dog too much to eat. There were wild whoops when the Saluki gradually gained and eventually turned her; and

then commenced a most skilful piece of dodging, in which the Hare scored each time. There were portions of bare gravel and some patches with *Arfaj* bushes about eighteen inches high scattered over them—not much cover, it is true, but she knew it would be to her advantage, such as it was. In the first rush she had been pushed out into the open, and she now came back, manœuvring by a succession of quick turns, at each of which the dog shot many yards ahead before he could stop. She gradually approached her goal and gained the scrub. But the dog was fairly close, the bushes did not hide her, and he pressed her so hard that she miscalculated the width of the cover and found herself in the open ground on the other side, with the Saluki still close behind. She seemed deliberately to go slowly, for he caught her up with three or four great bounds, and was no doubt ready to grab either to right or left as she dodged. She did neither, but stopped dead and, squatting flat, let the dog go right over the top of her; while he shot on ahead raising a cloud of dust, she ran back into the cover and then, remembering its width, turned to the right and ran up the middle of the strip. The Saluki, enveloped in his own dust-storm, turned and could see nothing, and went off in what he thought was the most likely direction. It was the wrong one, and he never saw her again. She was a clever Hare and deserved to live. We had been left about half a mile behind, and the Hare was then barely visible and was soon out of sight. When we arrived on the scene the Saluki was very nearly exhausted; but Saleh's blood was thoroughly roused, and slipping from his saddle he tracked the footprints until he disappeared over the horizon, while his camel meandered on with the rest. Eventually by running and walking he caught us up, the Hare having taken to some hard gravel, leaving him without any track to follow. The Saluki was given a long drink and was then taken up on a camel to rest. An English Hare would, I think, have run away from the Saluki, but its larger size would make it unsuitable

for survival under desert conditions, even with desert colouring.

An hour later, another Hare was moved a long way ahead, and by the time the Saluki was pushed off the camel she must have started with a lead of 400 yards. It was splendid to see him really extended and overhauling her with long strides on the broad plain. The Hare was quite out of our sight when he first turned her; we could only follow the hunt by the movements of the dog, who seemed to be tiring with the length of the first spurt, and we imagined the Hare was going to outrun him in the open. At the second turn the pair were nearer, and we saw him turn and try to grab her, and the third time he had her. Having killed her, he looked round and found we were too far out of the picture to count; so picking up his prize, he carried it to a suitable bush surrounded by sand, where he proceeded to dig a hole and give her a decent burial. When we at last got the lumbering camels on the scene, she was completely hidden in sand and the Saluki was recovering his breath in quite another quarter.

We had not been successful in finding a walking stone, but Saleh brought me a round white pebble which, he said, was one of those that do walk, although they may be any colour. During our halt for coffee, I had settled down by the fire, when suddenly Saleh, who was wandering around in the bushes, began to call out, "Sahib! Sahib!" and dance round in a high state of glee. Thinking he had found something new, I was about to join him, but was restrained by Muhammad Hasan, who said mysteriously, "Don't go; it's nothing." The yells broke out again and then stopped suddenly. The abrupt silence was greeted with a roar of laughter from the men, and I learnt that they, having seen the sort of stone that was likely to walk and heard the description of its track, and knowing Saleh's habit of never sitting down when he could walk about, had arranged an exact representation of the curling path with a very suitable stone at the end of it. The trick had

been well conceived, and he had been quite taken in until, too late, he had discovered their footmarks and read the whole story on the sand—hence the abrupt termination of his rejoicings. I had to join in the general laughter that greeted his crestfallen return to the circle, although it had become evident that my appreciation of Saleh's desert craft was producing an undercurrent of jealousy in the hearts of the soldiers, and I was anxious not to strengthen it or give it any encouragement to assert itself in any hostile action on their part towards him. At the moment we were entirely dependent on his leading us to the next well without delay; and had anything happened to him, I should have been sorry to trust our fortunes to any of the others in the matter of taking us straight to water. Now that we had the outward journey fresh in our memories as a rough guide, I should, no doubt, have reached Hufuf eventually; whereas had we lost Saleh on our way to Jabrin, we might easily have missed it and wandered past into the Great Desert beyond.

Saleh said that the large gravel plain called Summan lay to our north-west. This led me to connect it with the plain on which we were journeying. It continues far to the north, marching with the Dahana and to the east of it, the relative positions of Summan and Dahana having been recorded by travellers who had crossed them on their way into the interior from Hufuf and Kuwait. He also indicated the Sahba-Saramid boundary; it lies across a featureless gravel plain and there is nothing whatever to indicate the line except that it is supposed to run eastward and westward, and would probably be parallel with the course of the Wadi. We entered the Jafura dunes and camped at Zaida Jafura, in the vicinity of the outrunning tongue of dunes, the Barqa Dhumairan, which stretches across the gravel plain and goes over the western horizon to join the dunes of the Dahana. It has been difficult to ascertain where the southern boundary of the Dahana joins the northern limit of Al Rimal. From Saleh's account the

Al Rimal ran west of Jabrin, and went north to join the Dahana. It is one continuous sand-dune belt and crosses the depression of Wadi Sahba to the west of my route, parallel to the Jafura dunes to my east.

[*February 26.*] We struck out on to the gravel plain but did not get far from the edge of the dunes, and in the afternoon, having drifted a little east, came into them once more. The grazing was good, and the tired and hungry camels were glad to combine business with pleasure and graze as they marched. Although the time that had elapsed since we passed before had made no appreciable difference to the dried-up vegetation on the gravel, that on the sand had made great strides, and some of the bushes, particularly *Arfaj*, *Hallam*, and *Abel*, were becoming green. Nevertheless, large quantities of camels, the tribal herds, for example, would have found but a bare living.

There was another shortage of water; in fact we were no better off than on our last journey, as Khalid knocked the string off the mouth of the extra water-skin fixed to his camel during a hare-hunt, and went along scattering and splashing the water over the sand like a water-cart. Everyone saw and heard it but himself, and by the time the men made him realise that they were shouting at him and not at the Hare, and he had perceived what was happening, there was very little left.

As we mounted the crest of a dune, a Ratel, called *Dhriban*, a grey and black animal, very like a Badger in size and appearance, was surprised at close quarters in a hollow. It went rolling off at an awkward gait with Saleh in hot pursuit, dismounted and rifle in hand. He said afterwards that he was too excited to think of getting my twelve-bore gun. He could keep up with it quite easily, and by putting on a spurt he drew up close and had a running shot, but missed. During the reloading the animal disappeared over a dune, and when he tried to follow its tracks, the sandstorm, which was moving a good deal of sand, covered them up so that he could not go any further.

The effacement of footmarks is a contingency to be reckoned with in desert travel, and a man will be wise to keep his leader in sight when the sand is moving, or he may lose him altogether.

The only baggage that would be proof against the wear and tear of camel transport would be cast-iron boxes. My Wolseley valise presented a sad appearance where the see-saw motion of the ropes had cut through the canvas and exposed the bedding. My dispatch-case had had the side pulled out, which was perhaps due more to the folly of the man than the fault of the camel. It had been travelling in the saddle-bags all the time, till one of my Arabs, fearing that the jolting would send it through the bottom, had tied a string to the handle on one side of the box and fixed it to the saddle, so that all the weight and jar were thrown on the one side until it gave way.

We camped in the neighbourhood of Jabal Dharabin (Plate 36), near the place where we had caught the little Gerbil (*Gerbillus*). As I was anxious to secure more, we set traps all round the camp in the evening. The south wind that had been blowing all day dropped, and after a short interval the north wind could be heard approaching over the dune, some time before it reached us. It was a hot wind, registering 83° after dark, and brought with it a plague of little moths that formed a haze round my lamp, and smothered me as I sat close to it, trying to write with a low flame. Since it was almost impossible to continue writing with them in my eyes, nose and mouth, I abandoned my writing and collected specimens and put them in envelopes. Several of them have proved to belong to new species of desert-dwellers.

[February 27.] The north wind continued and was rising. Our traps, twelve in number, baited with coconut and dates, were all empty. One of them had actually caught one of the black Tenebrionid beetles, which was stealing the date with such energy that it sprang the trap; and during the night Jahad came to Mehdi in an

unconcerned manner to get one of the bigger traps detached from his big toe. He explained that he did not understand how it worked. Badawin feet are too hard to be affected by a pinch from a break-back rat-trap, and his only concern was not to injure the trap in getting it off. The failure of the traps was made all the more annoying by the discovery that the footmarks of the little Gerbils were all round the camp. While the tent was being pulled down, I followed the prints and found that they led to the side of the sand-hill about 200 yards away and then to a newly scratched hole. I had scarcely got on my knees to dig it out with my hands, when Saleh arrived and took over operations. With the instinct of a terrier he had left the loading of the camels for the more congenial atmosphere of a mouse-hunt. At a depth of one foot from the end of the hole, which was two feet in length, he drew out a little Gerbil. Once the habits of the species are known, this is a much simpler and quicker method of catching them than trapping.

We had not been many miles on the road when Khalid, who had been bringing up the rear, came up with a Jerboa that they had dug out. A little later, three Norfolk Plover (*Ædicnemus*, Arabic "Kurwan") were seen running among the sandhills. Khalid took off his shirt and, placing it on the top of his camel-stick and holding it at arm's length, waved it in the air. This ruse sent the birds into a bush, where they squatted. The only explanation of this effect must be that the shirt bore some resemblance to a Hawk; but I must confess I saw little similarity. The men then asked for my gun, and I found that it would not close, as the breech and all the joints were full of sand. This is always liable to happen in a sandstorm, but in this case the condition was aggravated because Mehdi in cleaning had not left the steel absolutely free of oil, and the granules had clung to it. The mechanism had to be all taken apart and scraped clean with a knife, while Khalid went on waving his shirt on high. He succeeded at last

in shooting two out of the three birds. I wanted to photograph the scene, but as usual the camel turned round and round. Photography from a camel's back is worse than shooting, as with a gun you can give the brute a whack on the side of the head with the barrel. The wind, which was in our teeth, was very unpleasant, blew sand in our eyes, shortened our tempers, and continually flung open my cloak when my hands were engaged in writing notes. Still it had the virtue of making the day cooler, and we decided to put on an extra spurt and reach Zarnuqa well before camping.

We got in after dark at the end of $11\frac{1}{2}$ hours' hard marching with only two halts of twenty minutes each during the day for coffee. The camels were all getting tired and required urging, but all were keeping up with one exception, and a man had to remain behind to ride the straggler along slowly. He usually gained the night's camp an hour or two after the others. Water was given to them on arrival. Mehdi and Saud went ahead to prepare a fire and had to give their two camels twenty-five of my canvas camp-buckets full of water between them. Each bucket would hold about a gallon, so we can roughly estimate that each animal swallowed from nine to twelve gallons of water.

[*February 28.*] Much colder than it was two days before. The north wind dropped at night but rose to a gentle breeze during the morning. There seems little doubt that the prevailing wind is northerly. It appears to be a ground wind, for the clouds are stationary when the sand is moving before the blast. We arrived at a bargain that Muhammad Hasan should push onward as he desired over the waterless country, and that once we reached the well our movements should be suggested by me. The day was spent, therefore, in resting, making up the skins, and writing up notes. A diary that is not kept up daily is of very little use, for day blends with day on journeys of this kind, and it is easy to confuse the order of events. We

woke up long after the sun rose, and the first incident of this day was a hot bath, or something as near it as one could manage in a hand-basin. The camels were not allowed to drink until the sun warmed the air. It was probable that they would drink a great deal, and a chill might easily be contracted. Their saddles were removed, and sore places were doctored with a pad of dates, the patients meanwhile endeavouring to take off the date poultice and eat it. Dates seem to be the sovereign remedy for all troubles throughout desert Arabia; we had already seen them used to solder a petrol tin, and now they were applied to heal the galled back of a camel.

My eyes were full of sand from the previous day's march, and Medhi's were worse, although I had handed over my pair of goggles to him, thinking they might help. The men, who had never seen anyone in motor-goggles, were highly amused at his appearance.

After the skins had been removed, we ate the two Norfolk Plovers, which seemed a great delicacy and made the boiled rice much more interesting. My bird was boiled in fat with a few bits of onion, but the others preferred theirs roasted dry in the ashes. By noon the sand was blowing as badly as the day before, and the clouds were high and of the thin ragged formation that foretells coming wind in England.

[*February 29.*] Our plans for the day were to send the baggage-camels direct to Dalaiqiya well, where the night would be spent, while the rest were to do a slight detour westward, as I wanted to travel along the eastern cliffs of Jabal Kharma Zarnuqa. I also insisted that both Khalid and Saleh, the two best naturalists, should be of my party. Muhammad Hasan soon found a Jerboa's hole and, as I wanted a photograph of the entrance, they all stood aside until it was taken; but the delay and the vibration of the camels' arrival had placed the little rodent on the alert. Before the back exit had been discovered he opened it and escaped. An amusing hunt by a dog and three men resulted. Without the Saluki the men would have been left far behind, and

although the dog was able to turn the quarry, its Kangaroo-like hops were much too quick for him. The Jerboa has brought dodging to a fine art. In fact, dogs that have had much to do with Jerboas will not go after them, and will even pretend that they do not see them. The fun was fast and furious, for several times the chase went through the ranks of the men, and each one grabbed in a different direction and got only a handful of sand. The Jerboa threw off all its pursuers and disappeared down the big earth of a Spiny-tailed Lizard. It was some consolation that the photograph showing the artfully concealed entrance came out well (Plates 59, 61).

The men were anxious to continue the journey into Hufuf, as we had encountered a wood-gatherer with his donkey, who was pounced upon for the latest news of the town. He told them of the hurried departure for Riyadh of both the Sultan and the Governor. The Sultan's unexpected change of plans would of itself have raised a lot of speculation as to the cause underlying it; and the Governor had not been to Najd since taking over his duties at Hufuf some ten years previously. The reason given, that he wished to salam with Abdul Rahman, the aged father of the Sultan, was not convincing and was believed by no one; but I noticed that the men all sedulously repeated it when discussing the matter. It was evident that events of importance had been happening while we were away, and it was natural that the men should be anxious to hear more about them. They one and all agreed that these particular hills had no birds in them, and I left them sitting under the shade with the camels and went off for a tour of inspection of the highest cliffs at the north-east corner (Plate 34). I soon had stalked a pair of the Desert Eagle-Owls, a most valuable addition to my collection, as it now included a workable series of four skins.

The most exciting experience of the day was, however, in store. Just as I was rounding a crag, a large Buzzard

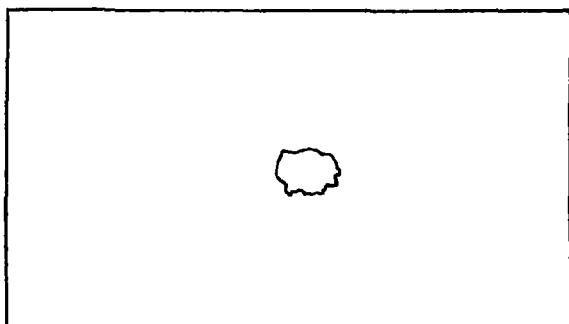


59. CONCEALED HOLE OF JERBOA.
(KEY ON NEXT PAGE.)

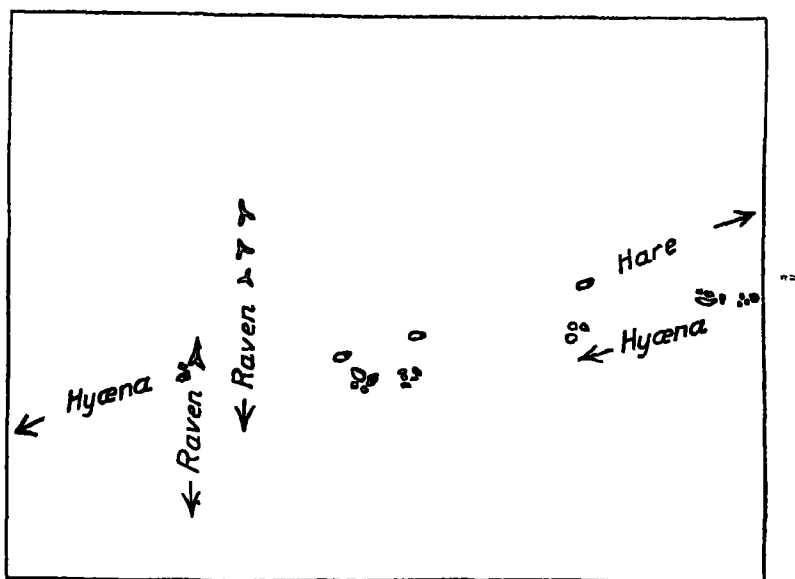


60. TRACKS OF HYÆNA, HARE, AND RAVEN, JABRIN.
(KEY ON NEXT PAGE.)

flew off and dashed over my head and disappeared over the edge of the crest. There was just time to get in one barrel, and I felt sure I had hit the bird; but the whole



61. KEY TO CONCEALED HOLE OF JERBOA.
(BOTTOM HALF OF PHOTOGRAPH)



62. KEY TO TRACKS OF HYÆNA, RAVEN, AND HARE.

affair was over in a moment and I searched the ground where it might have fallen, on the other side of the hill, without seeing any sign of it. While still seeking, I discovered a nest in the cliff face, and the young Buzzards

could be heard in it. Here was a problem. The parent had possibly been killed, and I could not leave the young to probable starvation. The cliff face was unclimbable, but the far side of the hill was not so steep and was scalable. From the crest I looked down into the nest and saw that it could be reached by a narrow ledge, at the far end of which it was built; and in it there were three white fluffy young. There was just width enough for me to crawl along caterpillar-fashion, flat on my stomach, and thus the young were taken. But returning by the same method was not so easy. The feet seemed unable to steer themselves straight backwards, and preferred to dangle over the edge, where a hundred-foot drop on to the rocks below offered an uninviting prospect. The men, who were far out of hearing, would possibly not have been much help, but they could have guided my feet when I had backed within reach of them. During my struggles two of the little birds fell over and were killed instantly, and the survivor was only just grabbed in time. The distance of ten yards had to be traversed half an inch at a time, and I breathed much more freely when I stood once more on the firm ground of the hill-top. The men looked very shamefaced when I showed them my capture and asked them if they still thought no birds would be found in Jabal Khurma Zarnuqa. We rode round to the face of the cliff, as I wanted a photograph of the nest. The men were flabbergasted when they got below the cliff, and wondered how I got to the nest. They still think I went up the perpendicular face of the sandstone, as I did not tell them that there was a much easier way on the other side. The little Buzzard joined the caravan and rode in an old canvas pail on Mehdi's camel. It flourished on the fresh-killed birds and animals after they were skinned. We reached Dalaiqiya in good time, and Mehdi and I put in three hours' skinning.

[*March 1.*] Muhammad Hasan went off to Hufuf early by himself. He made the pretext that he wanted to see if all arrangements for my comfort on our entry had

been made, but I knew that he was unable to curb his curiosity. He heard that Fahad ibn Jiluwi had been placed in charge as Deputy Governor during his father's absence.

Saleh set some traps the night before and caught a *Dipodillus*, one of the tiniest of the desert rodents, smaller than the house mouse, and of pale desert colouring. It had fallen to a bait of date.

The baggage wandered off direct for the town, and I led Saleh and Saud to Jabal Arba, where I wanted to take bearings on to the hills around the oasis, now laid out in a panorama to our north. From that point a good idea could be obtained of the southern margin of the date-palms and the number of big lakes of spill-water lying beyond them. There was the nest of an Egyptian Vulture on the high cliffs, and the first signs of the returning spring migrants were in evidence. Two Hoopoes passed us heading northward, flying fast and low over the sands. Their direction indicated that they had passed through the Great South Desert. There seems every indication that most migration takes place near the ground and not at high altitudes as was once supposed. The Warblers, which travel as far as any birds, certainly carry out their long trek by a series of short flights, almost from bush to bush, except when they have to cross the seas.

On the way Saleh stalked and shot two Spotted Sandgrouse. There would seem nothing very remarkable in this, but they were the first and only game birds obtained during a journey organised especially as a shooting expedition, and as such they deserve mention.

Saleh asked if he could come and see me in Hufuf when the rest were not present. He was obviously afraid lest the present I gave him should be taken away from him, and I thought he would be lucky if he got away with all of it. Over the receipt of presents these people behave like vultures feeding on a carcass. The weaker ones sit and look on until the stronger are satiated. One might almost as well give the whole to the big man and tell him

to divide out any that he doesn't want himself. Saleh, however, seemed to take the view that if he got first hold on his portion, he might be able to keep a grip on some of it.

My arrival at the door of the guest-house was not impressive. The second stage of the descent of a camel is a backwards motion ; that is, the folding of the back legs jerks you rearwards as violently as the first motion is apt to send the unwary over the forward pommel. The girth was not properly fastened, and as we reached the ground the whole saddle came over the camel's tail with me underneath, buried among the débris of cloths, guns, camera, and many other bulky oddments. The crowds in the street stood aghast and cried "Allah !" and then all rushed forward to extricate me, as I was quite unable to move. There was general relief when I crawled out none the worse.

CHAPTER XVII

HUFUF ONCE MORE

I WAS touched to find that during my absence a correctly designed bath-house had been built on the veranda for my use. It was probable that the authorities had consulted Abdulla Effendi, who had seen bathrooms in Baghdad. I called on Fahad, the acting Governor, to pay my respects and also to find out where we stood with regard to future plans. He was about twenty-five, and a young edition of his father, with the same squat figure and brusque manner.

After saying how excellent the arrangements for my journey to Jabrin had been, and describing the chief incidents of the road and the features of the oasis itself, as he confessed he had never been there, I broached the subject of my going on to Riyadh. He explained that the Sultan had not gone to Riyadh, but had been compelled hurriedly to go to the Qasim, a far cry to the north, where some of his turbulent subjects had been giving trouble. He had left so unexpectedly that nothing had been said about me, and nothing could be done until he returned in a couple of months, as a message could not reach him and a reply to it be received in less than that time. I asked what he thought I ought to do, and his opinion was that the Sultan would expect to find me there on his return ; I was welcome to stay on in Hufuf. I explained that my time was up, and that a two months' wait was out of the question, but I would think it over and let him know in a day or so. He improved on the first invitation by saying I was welcome to stay two years, but, if I had to leave, perhaps the Sultan would invite me again to visit Riyadh when his hands were not so full.

Muhammad Hasan seemed very much perturbed over the news, and was unusually silent ; he evidently thought something serious had happened. Saleh was also uneasy, but from another reason, for the Governor had promised him the loan of a camel to take him back to his tribe in Juda, and he thought there was little chance of getting it out of the son Fahad.

The Sultan had left all his wives in Hufuf, but his sons had gone with him, and of course the men of the Ibn Rashid family as well. I was quite in the dark and could think of no explanation for the sudden migration until some time later when, on reaching the coast, I heard of the false reports of his death, originating in Palestine and copied by the English Press. As his hurried departure coincided with the time when he would receive the news of his own decease, it is quite possible he had to go and show himself in the flesh in order to forestall the disturbances likely to break out in such an unstable element as a group of Arab societies on the death of a Sultan.

[*March 2.*] It was like being at home again after the strain of constant work and the wear and tear of travel. The hot milk and hard-boiled eggs with bread that arrived for breakfast were luxuries.

The men came up singly to my room and were thanked individually for their share of the journey and rewarded according to their efforts. Muhammad Hasan got the biggest reward as leader ; he had done exceedingly well for a youngster and had made every effort to help with the collection. Saud, the other soldier, who had acted as cook, had played his part well and came next, and Saleh, Khalid, and the two others in the order named. Saleh was given in addition one of the hunting-knives with the buck's-horn handles, and with this he was more than delighted ; but it brought about a tragedy, having raised the green-eyed monster in the bosom of the two soldiers, since he foolishly displayed it before their eyes when he got downstairs instead of wrapping it up and keeping quiet

about it. As this was the last time I should see Saleh, I made him tell me more about the Al Rimal. He first enumerated the animals that he had seen about Magainma, and described the place as being mostly sand-dunes with occasional strips of gravel plain like the Jafura we had passed over. There were the Jerboa, not many of the larger Gerbils (*Meriones*), a Wild-Cat that was bigger than the tame cats : Oryx, Gazelle, and Wolf were scarce ; Foxes and Hares abounded. The little Gerbil (*Gerbillus*) was plentiful as well as the Hedgehog. As for birds, he mentioned the Spotted Sand-grouse (only occasionally seen) and a few Eagles, Ravens, and Houbara. The plants were *Zahar*, *Andab*, *Sabat*, *Jemin*, *Hadh*, *Alqa*, *Halab*, *Birqan*. Not having specimens, I have found it impossible to identify them, with the exception of one or two that are referred to in Appendix VI.

He also spoke of the Bir Aziz group of wells again. If he confirmed his information by speaking twice or more often on separate days, and both accounts agreed, one could take it that they were more or less correct. Bir Aziz is five or six days from Jabrin in among sand-dunes. There is a group of three or four wells that are very deep, but the water is sweet. Another well, Hedba, lies half a day's journey south of Bir Aziz. Alwa well he placed three hours west of Bir Aziz, and near by is Utsa. Neither of these is deep, and the water is only moderately good. Bir Aziz was already placed on the map, but too close to Jabrin. The other wells are new names, but I have considered them sufficiently authenticated to be included, with a query mark after them to signify that their exact positions have not been ascertained.

And now comes the sad tale of what followed the distribution of "bounty," as Muhammad Hasan called it ; it certainly is a prettier word than "backsheesh." The first intimation was the arrival of Saud, looking very important and with the air of a man who has arrived on a mission that he thought he was going to enjoy, but on

which at the moment he wishes he had not started. He began with "Shaikh Fahad sends his Salam Alaikum!" and I said, "Sit down and welcome," and stopped my packing. He then produced a hunting-knife of a familiar pattern and said: "Fahad says such things should not be given to badawin, and he has put Saleh in prison and taken the knife away and returns it to you." The next, I am sure, was his own addition: "Such things should be only given to soldiers." He spoke with such ill-suppressed rage when he said "Such things should not be given to badawin," and the "badawin" was uttered in such scorn, that I felt certain poor Saleh had been the victim of these two soldiers' jealousy. I merely replied, "All right!" and went on with my packing as if nothing had happened. He sat for a moment, then left the knife and went out.

When he had gone I stopped packing. It could not have been true that it was not a suitable present for a badawin, as many of them carry a dagger and a rifle; so there could be no objection on the score of arming tribesmen. My next news of the incident was from Mehdi, who had the latest gossip from the coffee-hearth. He had been ready to bait Saleh, but now he was indignant at the injustice that had been done him. His version was that Muhammad Hasan had told Fahad that Saleh had behaved badly on the journey, had asked for clothes, and had forced me to give him money and the knife. Fahad had ordered him to have fifty strokes and to be put in prison; the money and the knife were to be taken away from him. Mehdi wanted me to go round and see Fahad and get him released. Knowing that all I said would be repeated at the coffee-hearth and carried to headquarters, I had to give a suitable reply for that destination, and said: "Shaikh Fahad has more knowledge of governing the badawin than I have or even you have, and I don't propose to try to teach him what I do not understand."

And while I said it my heart ached for the poor wretch; his delight was so short-lived. There might, of course, be

another side to the affair, but I did not wish to ask any more questions. The slightest interference would only have made it worse for him. As the matter stood, in return for faultless guidance across three hundred miles of waterless marching on the outward and return journeys, and indefatigable hunting for my benefit, he was rewarded with a hiding and imprisonment. Probably Fahad, being young and inexperienced in the wiles of jealousy, was led by Muhammad's story into a hasty judgment, whereas his father would have listened to both accounts, weighed the evidence, and formed a conclusion very much nearer the truth. I had given both Muhammad Hasan and Saud a knife each a month before, and now learned that they were prized above everything else, and Mehdi informed me that the Governor had admired the steel to such an extent that they had offered them to him, and he had accepted them and intended to have gold handles put on in place of the buck's-horn, as presents for his sons; it would therefore have been galling to them to see Saleh with a treasure of which they had themselves been deprived. If they reckoned on my taking Saud's hint and giving the knife to them, they made a grave mistake. I told Mehdi that I would present the knife to him, and he said with dry humour that he would very much like to have it, but he would prefer the presentation to take place after we got out of Hufuf, as someone else might want it.

[*March 3.*] No wind; heavy clouds, especially in the west, threatened rain.

Another feathered traveller from Africa appeared; a common Rock-Thrush was resting on a wall near the house. The dates of arrival of these birds in Iraq had been recorded for several years, and some notes on the spring movements of this and other species appear in Appendix II.

I was still very sore over the incident of Saleh, and my attitude towards Muhammad Hasan had been purposely changed. I had sent a message to Fahad to say that I

could not await the Sultan's return and was occupied with final preparations to depart for Bahrain. Meanwhile, since cash had run out, it was necessary to ask Qusaibi to cash a cheque on the Bahrain Bank, which he did. Muhammad Hasan, who wanted to take a fatherly interest in the proceeding, was not consulted. He learnt, however, that I was only taking one hundred rupees, which he foresaw would not include a large sum for him when divided out. My intention was not to give any presents on leaving as a protest against Saleh's treatment, but not to say so in so many words lest more retaliation should fall on his unlucky shoulders. It suited me better to arrange the matter of presents with the House of Qusaibi in Bahrain, when the merits of each recipient could be assessed better and without his own supervision.

Muhammad Effendi called during the afternoon. I had an idea that he was coming to announce the impossibility of obtaining camels just for the present ; but my fears were unfounded, and he merely came to say farewell. He asked many questions about the conditions of life and agriculture at Jabrin, doubtless with an eye to revenue, but I fear my account did little to encourage any hopes he may have held in that direction. As he had told me of the spirits that haunted the buildings there, I unintentionally caused him to make an amusing slip. The word for a spirit in Arabic, *jin*, is pronounced exactly the same as the English for a spirit of a more worldly origin, of which a good Wahhabi is not supposed to know the existence. When I said that he had made excellent arrangements with the exception of the *jin* he had promised, he replied apologetically, " No, but there is some at Oqair." It took me some moments to realise that he had mistaken my meaning and thought I was reproaching him for not concealing a bottle of the pernicious liquid among the dates and rice. As Muhammad Hasan only was present, who did not know the English word gin, the humour of the situation was luckily lost on him, and he only perceived that the Effendi had not

understood my remark, and explained that the *jin* of Jabrin had failed to put in an appearance; thus he cleared the air in more ways than one.

Muhammad Hasan was very much disturbed at being excluded from my counsels, and was beginning to realise that he made an error of judgment in several respects when he gave false evidence against Saleh. He tried several times to bring him into the conversation and give his version, but I refused to allude to the subject. He was also disturbed about the present I was going to give Shaikh Rashid in return for the Saluki. He had apparently settled in his own mind the portion he was to get out of the transaction, and now realised that the matter would be dealt with in Bahrain, where he would not have a hand in the settlement. The working of his mind was like an open book, and the by-play was most amusing. He came to say that the owner of the Saluki had asked him about the recompense; what was he to say? I knew the owner was 150 miles away and had said no such thing, so I replied that the owner could have the dog, it was here in the house ready. I did not want it; it was he who suggested giving me the dog, and if he did not like my terms he could still have it. He hastily explained that he, Hasan, understood, but the owner was a "bedu," badawin—no understanding, no heart.

I bought a skin of Khelas and Reziz dates, each packet weighing about 30 lbs. I gave five rupees for the two, and understood that the market price would be about one rupee less.

[*March 4.*] West wind and a few showers, not so welcome now, for the road through the gardens might become slippery and the camels would have to wait for a day or two. Our plan was to reach Jisha and stay the night and cover the Jisha to Oqair desert the following day. The donkeys' arrival to take the kit was the first sign of approaching departure. The courtyard of the house seemed full of them with their attendants, whose shouting was answered

by the braying of the animals, those laden and bulging with my precious boxes charging one another and trying to squeeze through narrow doorways. I was relieved when the last one was finished and guided out into the street, where most of the loads shifted and looked like falling off, but the collisions were inaudible once they had turned the corner.

It was amusing to see the wiles employed by the staff as the time grew shorter. It was all done very nicely, but was very pointed—just gentle reminders that the “bounty” was still in my hands. I thought of Saleh and hardened my heart, and held to my original intention to send it from Bahrain, thinking that the fright would do them no harm. Any excuse sufficed to send one or other up the stairs to attend to some trifling service. The coffee man brought extra coffee to announce that the camels had arrived, that I should next salam with the Shaikh, “and then you leave”—looking hard at me meanwhile.

The Saluki had gone ahead with the donkeys, led by a rope. Like a true badawin, he loathed the confined spaces of a house and escaped whenever the door was left open. He was also rescued from perilous positions on the top of walls, for he ran along them with the agility of a cat.

Muhammad Hasan arrived to say that Fahad was ready to receive me and bid me good-bye. The latter was more genial than at our first interview, as the shyness appertaining to his first appearance in an important office had worn off. I met him with a smile that he returned. He seemed pleased with the fair speech which I had carefully prepared. The conversation, mostly of my making, ran on shooting and hunting and hawking. He beckoned to one of the soldiers and whispered in his ear. This is usually a prelude to, and is indeed an order for, a present to be given to the departing guest. Leaving grateful messages to his father, Shaikh Abdulla, whom he said he expected back in ten days, I took my departure.

The camels were all standing in readiness by the guest-

house door, and my whole staff in their best clothes were there to see me off : I shook hands with each one and thanked them and was preparing to mount, when Muhammad Hasan stopped me and said in an embarrassed voice, "Wait a little—the ibn Shaikh" (son of the Shaikh, meaning Fahad) "is sending something." Apparently, Fahad's rank being only acting, he was not officially gazetted with a title of office. Next minute there arrived a slave leading a fine Arab stallion, a thick-set bay with black points, of the famous Suwaiti or Najd breed (Plate 64). It was a handsome present, for which I was totally unprepared, and as my practical mind at once jumped to the problem of what I was going to do with it, and had visions of getting it on the tipsy boat at Oqair and off a tipsy boat on to the steamer at Bahrain, not to mention several other complications, I found I was wearing quite the wrong expression for a man who was receiving a magnificent example of Arab horseflesh, and that had to be quickly altered. There was no time to give the groom a present as is customary, and I heard the optimistic Muhammad Hasan telling him that I would probably give it to him at Oqair to bring back. Neither was there time to borrow a saddle, and as the horse refused to be led by a rope from the camel, Muhammad Hasan had to ride it barebacked. It had been excited by the crowd and the camels, and he had first to lead it out of the town and then got on without further trouble. Much of the road under the palms was slippery after the showers, and we had to go very slowly, making Jisha about sunset. We went to the house of the Amir as we had done when coming from Bahrain.

He had some tame white rabbits and a few cats in the courtyard, and on hearing a noise as if the roof were coming in, we found that my Saluki had caused a general stampede and was following up his success on the roofs. He got his first education in the classification of animals, which he thought were all Hares. Having cornered a cat, he went

in like a lion, only to experience the difference in the matter of toe-nails, and came downstairs howling, to be tied up in the stable.

Muhammad was having another try to get a footing in the dog deal. Afraid to approach the subject himself, he hoped to reopen negotiations through the medium of Mehdi, who told me that Muhammad Hasan was placed in a difficult position, as he had already given the owner fifty rupees for the dog on my behalf. I told Mehdi there was no difficulty, for if Muhammad Hasan had given fifty rupees the dog was his, and I considered he had bought it very reasonably.

[*March 5.*] We were off with the sunrise. Although I did not mention it to the kindly old Amir, he was on the list for a bag of rice when I reached Bahrain. Our departure was not uneventful. The little Buzzard was riding in his canvas bucket chirping merrily; the Saluki, just liberated from the stable, was tearing madly round the narrow streets of the town, upsetting the composure of the stallion, who wanted to do likewise. When I arrived in the square, a few early risers were watching the scene. Every few seconds the dog crossed the square like a flash, issuing from one street and disappearing down another. At each reappearance the stallion struggled to free itself from its head-rope, at the other end of which was Muhammad Hasan. Mehdi stood by with the air of a stage hero, and I divined that out of bravado he proposed to get on its back. I ordered him to get on his camel, and we left Muhammad Hasan to manage the horse as best he could. We had not reached the town walls when a commotion behind caused us to turn and see the Saluki coming our way, with the stallion in hot pursuit with a swinging head-rope and no horseman. We managed to bar the way with the camels and stopped and captured the horse until its would-be rider appeared. On leading it outside the gate, he got on without any trouble and it walked quietly enough into Oqair.

We had the full blast of a high north wind the whole day, and the blowing sand spoilt any enjoyment and assailed our eyes and filled the coffee-cups. We sighted Oqair Fort half an hour before sunset. The Saluki was ahead with Mehdi as we approached, and the usual rabble of pariah dogs came yelping from the town to attack the intruder. We were too far behind to assist, and it seemed inevitable that my dog would soon be in the middle and get badly mauled. But Mehdi jumped from his camel and, clutching his beloved "Najman," kept the curs at bay, though several had sly nips at the Saluki's flanks as he was dragged to safety in the Fort.

The Amir was away, and his deputy greeted me, and soon Khalil Effendi, the Revenue official, came to invite me to a meal at his house. Muhammad Hasan was not invited and came in afterwards for coffee. He appeared to feel aggrieved at the omission, as he had been a person of importance wherever we had stayed, but in Oqair he had to feed at the house of the Amir with the other Government officials and soldiery.

The theodolite was erected and observations on Regulus, Andromeda, and Polaris were taken to check my previous figures. The instrument was covered with sand, but as far as I could judge had not been vitally injured by its varied adventures.

[*March 6.*] The strong north wind had held up several boats that were ready to sail for Bahrain, but they were expected to be off shortly, as the wind had dropped considerably (Plate 63). I was keeping one back as I wanted to have one more examination of the ruin site at Abu Zahmul, and also hoped to take another bearing from there to Jabal Dukhan on Bahrain Island. It is only under special weather conditions that this can be seen from the Hufuf road sand-hills, and I think early morning is essential. I was fortunate in getting the view on the morning of my departure to Hufuf in November, and was unwise not to have made more of the opportunity by dismounting from

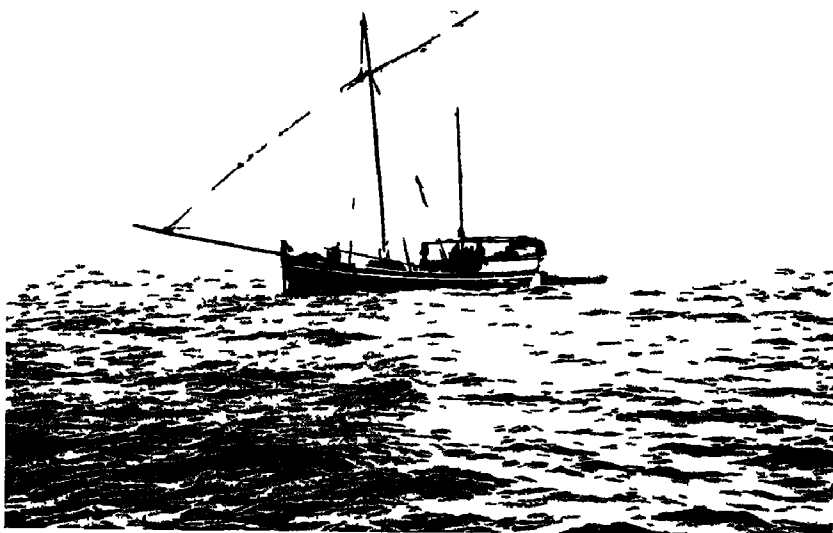
my camel to take the reading. The hill was quite invisible on the second occasion. My impression of the ruin-field was that it was even bigger than I had at first considered, and I found that it extended further to the north; but there was no time to settle down to an investigation of the foundations by digging, as the boat was already being delayed on my account. There was a little feeling in evidence between the two departments, Military and Revenue, the status of each being made a matter of controversy by the absence of the regular Amir, and on my return I was invited to eat with the Amir and Khalil Effendi at the same time. We got over the difficulty by my accepting and eating both meals.

The four officials all came to the quay to see me off, their differences healed by my double dose of breakfast, and I took a photograph of them. The embarkation of the horse was a simple operation (Plate 64). It was led up to the quay, and two men standing on the boat placed a rope round its body and without further ceremony pulled it sideways and sprawling into the bottom of the boat, where it was fixed with a large balk of timber.

We sailed outside the harbour mouth, which we had entered on November 17, and anchored there to await a southerly wind, spending the whole of the next day either becalmed or creeping northward with barely sufficient wind to fill the sail. We reached Bahrain harbour the following morning.

Directing my footsteps to the house of Qusaibi with a bag of rupees, I gave him a list of the bounty I desired his brother to distribute in Hufuf and the neighbourhood, handing him the corresponding amount in cash. The price of rice was 24 rupees 12 annas (thirty-three shillings) per bag of 168 lbs. in Hufuf.

The journey to Basra was uneventful. The steamer by which I returned to England was lying in the Shatt al Arab, loading cargo in mid-stream, and I was able to go



63 A BACHALA LEAVING OQAIK FOR BAHRAIN



64 EMBARKING AT OQAIK THE STATION PRESENTED TO THE AUTHOR BY
H H THE SULIAN IBN SAUD

aboard with all the packages. Mehdi was to attend me until the ship left, and then return to his home in Baghdad.

On the day when we were due to sail he did not arrive, and eventually a man in a rowing boat came alongside with an S.O.S. message to the effect that Mehdi was in prison and begged me to come and bail him out. As we rowed over to the shore I heard there had been a wordy argument between the boy and a cab-driver as to whether the fare for a ride should be sixpence or ninepence, and the police had arrested the two disputants. After a night in jail they had almost agreed to split the difference, but on my appearance the cab-driver magnanimously withdrew the charge altogether. With a few words of advice I said good-bye to Mehdi and hurried back to the ship.

On my arrival in England I found that every specimen collected during the expedition had reached its destination. The boxes that had preceded me from Hufuf had been delivered without mishap at the British Museum, thanks to the kind co-operation, first of Shaikh Abdulla, then of Major Daly, and finally Sir Arnold Wilson (who had sent them on a direct London boat from Mohommerah).

It may be useful to summarise here the results of my journey. The Al Murra tribe and their mysterious oasis of Jabrin had been visited and photographed. The Great South Desert had at last been penetrated, and the route mapped for a distance of 150 miles in previously unexplored country. Wadi Sahba had been seen for the first time by European eyes, and its connection with Wadi Hanifa in Najd confirmed. Equally important from the point of view of Arabian hydrography was the proof of the non-existence of two immense rivers or drainage channels that have figured largely in Arabian maps from the earliest times, under the names of Wadi Jabrin and Wadi Aftan. Our route ought to have crossed their line had they existed, and they now must be regarded as mythical. The information imparted by Saleh as to conditions in the centre of the Great South Desert is of value,

particularly as regards the existence of an intermittent water-flow in wells at Magainma, a place that had never been heard of before, and he has added to our knowledge of the shape and extent of the great sand-dune tracts. The discovery of the ruin-field at Abu Zahmul has strengthened the claims made by previous historiographers, that Oqair is the site of the ancient Phœnician port of Gerra.

The latitude and longitude of Oqair, Hufuf, and Jabrin, and the latitude of Wadi Sahba were astronomically determined. All these had been provisionally placed on maps, but their positions had not previously been accurately fixed. Philby had, however, obtained the latitude of Hufuf.

As regards the collections, the 48 specimens of mammals represent 18 species, of which 5 species and 4 subspecies are new to science. The 127 specimens of birds contain 34 species, of which 3 subspecies are new. The 22 specimens of reptiles represent 11 species, of which 3 have not been previously recorded from Arabia. The 20 adult and 17 immature specimens of fish are all of one species. The 73 specimens of insects represent 35 species, of which 4 species and 1 subspecies are new. The 36 specimens of plants represent 23 indigenous and 13 cultivated species; 2 of the indigenous species are new to the Arabian List. Geological specimens were obtained from Hufuf, Jafura, Wadi Sahba, and Jabrin.

CHAPTER XVIII

DESERT COLOUR AND PROTECTIVE COLOUR

BIRDS

FROM this chapter it will be evident that I am a believer in the assumption of desert colour by the desert fauna solely owing to the protection afforded by invisibility in their natural environment either for defensive or offensive purposes. My theme will be much better understood if this section be read in conjunction with an excellent study of the subject by Dr. P. A. Buxton, *Animal Life in Deserts*. I have found the material he has collected has helped me to arrange my opinions, which, however, are often in disagreement with his. I would go further and say that his deductions do not appear to be always in agreement with the weight of evidence he has himself produced. On some points he leads the reader on by a series of well-marshalled facts, but leaves him at the end to form his own conclusions. On others the author's opinion is itself so protectively coloured that, for this as well as for other reasons previously mentioned, it is difficult to believe him when in his concluding sentence he tells us that in his view "no progress is possible until we rid ourselves of our belief in protective coloration."

In a desert journey such as that to Jabrin the mind is naturally exercised in trying to find a reason for the fact that almost every specimen of bird, beast, reptile, and insect is arrayed in beautiful shades of pale creams and buffs. A drawer of specimens of different birds and animals from the true desert would excite the admiration and attract the attention even of anyone who was not a naturalist as being remarkable in this respect.

The first step in trying to make deductions on any subject is to eliminate as much as possible, and for this reason I must try to deal mainly with the birds and animals of the true desert, only introducing others by way of example because of our very meagre knowledge of the habits and conditions of life of the fauna of the true desert. For the purpose of this chapter I intend to divide desert country provisionally into two classes. No. 1 would include the larger waterless tracts of the Sahara, particularly Aïr in Asben, the Great South Desert of Arabia, often marked on maps as Ruba al Khali, or more correctly the southern half as "Ahqaf" and the northern as "Al Rimal." It would also include the Nafud in Southern Syria and possibly the Central Sind Desert and so on.

The features would be sand-dune areas, gravel plains, and small hill ranges of 200 to 300 feet above the plain. Water in this division is confined to wells at great distances apart, mostly artificial and only intermittently accessible to wild life by chance spill-water left after the watering of camels by badawin, so open water may be considered as non-existent. Rain pools only occur at long intervals, often of two or more years, and these, therefore, cannot count in the economy of wild life. There are no rivers and the land is colonised by a scanty vegetation of drought-resisting species of plants. Dew is therefore often the only annual water supply to the fauna of No. 1 division.

Division II would be the outskirts of No. 1, and would boast more vegetation and include Steppe deserts, with a short period of grass and similar plant-growth after annual rain, and also desert country through which a perennial river flows. Such would be North Africa towards the Mediterranean, the Palestine and Syrian desert, parts of the Nile Valley, Iraq, and of course others.

Any other division could not be called desert, although the forms found there would be paler than the dark browns and reddish-browns of the heavily afforested regions. It might be called intermediate, and despite its

being included in the desert belt of Asia and Africa meteorologically and geographically, there is more vegetation than in Divisions I or II, and the colour of the fauna can hardly be called desert colour.

I intend to introduce Division II as little as possible, and will only take examples from outside Division I to make clear my points. We can also eliminate migrants¹ and confine ourselves to the residents. No migrant bird can be expected to harmonise in colour with its environment in all the countries it passes through, varying from the tropical jungles of Central Africa, the white limestone plains and dark gravels, to the sandy waste of the deserts—the change taking place within a few weeks or even days and hours. Nor is such colour needed, as the eyes, ears, and powers of flight are relied on. At Oqair, where there was no cover, I saw a Hoopoe, a migrant of very conspicuous colour, being attacked by a Peregrine Falcon and a female Pallid Harrier at the same time, a very unusual and powerful combination. By skilful turns in the air the Hoopoe evaded the strokes of the Peregrine from above, and the Harrier striking upwards from below. The battle continued for two or three minutes until the two Hawks were exhausted and left the Hoopoe in peace. I do not intend to imply from this that Hoopoes never fall victims to Hawks, but it was a case where no protective colouring was needed.

The birds that have desert colouring to a remarkable degree are those that nest on the ground. They certainly retain that colour during the winter months, but, like the Hoopoe, they use their eyes and wings at the approach of a Hawk, during winter, in preference to utilising any resemblance they have to the ground colour. A few squat and escape by being unnoticed—such as Houbara and Norfolk Plover on occasions—but even these will often take to flight in preference. Where there are rocks and

¹ A more comprehensive study of the subject would have to include migrants in their breeding quarters.

vegetation most birds will take cover. It is noticeable that Desert Falcons have not the dash they have in England. A bird that is strong on the wing is fairly safe from them. The eastern form of the Peregrine (*Falco peregrinus calidus*) has been noted as acquiring debased habits around Iraq towns, where the birds wait for the evening to prey on early Bats and gain an easy meal in preference to trying an aerial flight at Pigeons, which are numerous. Again, all game is taken on the ground by Arab-trained Sakir and Peregrine. I doubt whether a wild Sakir would attempt an attack on an Houbara in winter. They always meet a Hawk with a full display of plumage, wings drooping and tail thrown over the back, and jump up and strike with their feet as the Hawk comes down. I have seen a well-timed blow stun a Hawk while the Bustard escaped by flight. The Houbara also often ejects an oily secretion over the Hawk's wings that handicaps its flight for the rest of the day. Neither of these mishaps would matter much to a trained Falcon, which would be picked up and attended to, but they would seriously affect a wild Falcon. It seems that colour protection is little resorted to or needed by birds in winter, and that birds of prey depend mostly on sickly or wounded birds for their food, and they are quick to notice one of these.

The Houbara is certainly one of the best examples of protective colouring. When walking on the flat plain it frequents, it looks like a small Turkey and is very conspicuous; but prostrate on the ground its beautiful pale buff shades, interrupted by fine brown vermiculations and barring, defy the eye of Hawk and man to detect it at ten yards' distance in spite of its size, so long as it remains motionless. If it were coloured black or black-and-white, it would attract attention at 600 yards. Its power of disappearance in its proper environment is almost incredible. We once drove up to a ruin near Baghdad in the barest desert in order to shoot Blue Rock Pigeons. Four men got out of the car and, after half an hour's battue,

to our amazement an Houbara rose from the bare ground, near one of the car-wheels, as one of the party nearly trod on it. Several naturalists have noticed that these colours only render the individual invisible so long as it keeps still. We may take it that birds have to move about most of the day to feed, and that resemblance to their surroundings while moving is not a necessity, as they are able to take care of themselves in many other ways, although we must acknowledge that such resemblance is made use of on occasions.

We should, however, be justified in eliminating the period of motion from our consideration of the colour problem, and in my opinion we must confine ourselves to the occasions when a bird is still, and to the time which is the most important to the existence of the race, also the time when it is most vulnerable, that is, the period of procreation. Every breeding bird has from a fortnight to a month in every year when it must sit motionless on its eggs, and afterwards, especially among the ground-surface breeders in open country, it has a further period when brooding on the nestlings. I think we can find proof that protective coloration does exist, and that its purpose is the invisibility of the parent and young during this anxious defenceless period. I was anxious to photograph the nest of the Houbara, and thought that by flying trained Falcons over the ground one might induce the sitting birds to show fight and thus give away the position of the nest. We covered a lot of ground and knew we had passed many sitting hens, because the cocks were frequently seen grouped together. Yet the Hawks failed to discover a single nest, and we, quartering the ground carefully, were equally unsuccessful.

The case is further strengthened by the fact that assimilative colours are much more fully developed in the females, and especially the active young, of ground-surface breeding species, than in any others. In marked contrast to all the others, the young of the Crab Plover, the only

wader I have seen which nests in a burrow, are the only young not protectively coloured.

We will now examine the habits and colours of the English Game Birds, because they are better known than many others. The hen Pheasant is beautifully protected by her colouring, whereas the male, which takes no interest in the nest or in the young when hatched, maintains a gorgeous plumage. The male Partridge resembles its mate on the back or visible surface, and both take their turn on the nest and care for the young. The Mallard is another example, the drake being arrayed in gaudy feathers and never assisting with incubation or the care of the young; the duck, which takes on the sole business of the nursery, is suitably garbed in sombre brown and is quite invisible in the reeds. It must not be argued that, because in the winter the duck is quite as conspicuous as the drake on the waters of a lake or in snow, her colour is not designed for protection. Ducks have another phase of protective colour that may be mentioned, called the eclipse plumage. During the moulting of the flight-feathers the gaudy drake is unable to fly, and for that short period when he is terrestrial he has developed an intermediate plumage of sombre brown, much resembling the duck's, and he skulks among the rushes. The cock Pheasant has no need of a dull eclipse plumage, as he moults his flight-feathers by degrees and is not left flightless, and he is always brilliant. The Common Sheldrake and Ruddy Sheldrake have females as brightly garbed as their mates, but they both nest in holes.

The weight of evidence seems to prove that the Pheasants, Ducks, and Partridges have developed their specialised colours for a purpose, and that purpose the protection afforded by their being invisible in their environment while on the nest or incapable of flight. Those who hold different views on the subject might possibly bring forward a few cases where a bright-coloured ground-surface breeding bird assists in the incubation, but

if they did it would not be general enough to contradict the theory, which is well supported by birds whose habits are really well known, and by many others so far as their conditions of life have been observed by competent field naturalists. For instance, the Avocet and Oyster-catcher are conspicuous ground-surface breeders, but while one such example comes to mind, one hundred species that conform to the rule could be cited.

According to my theory of the connection between the colour and the nesting period,¹ if the male takes over the entire duty of incubation he should be of more sombre plumage than the female, and this is so in three species I know of that adopt this very unusual procedure—the Gray Phalarope, Red-necked Phalarope, and Painted Snipe. In each of these the female is the brighter-coloured and would in the ordinary course be mistaken for the cock. As there are exceptions, it would be safer to say that the few species in which the female birds are brighter-coloured than the males are also abnormal in leaving the incubation and care of the young to the males. Another case of peculiar coloration in the female of a hole-breeding species is worth passing mention. Among all Palæarctic and most other Sparrows (*Passer*) the cocks have conspicuous colours and the hens are plain brown. In the case of the Tree Sparrow (*P. montanus*) the hen is brightly coloured and resembles the cock, and this species differs also in its nesting site from the others, as it prefers a hole in a tree when available, while other species that I have seen nesting prefer an open position in the branches, when they can obtain one. The Tree Sparrow bears comparison with the Sheldrake already mentioned.

We must now return to Division I of the desert and its avifauna and suggest reasons for another colour which appears. Buxton has drawn attention to the prevalence

¹ Other authors have mentioned the protective value of the assimilative colours possessed by certain female birds, but those whose works I have read do not seem to attach any particular importance to this, nor have they suggested that this period had influenced the colour.

of black and black-and-white as an alternative for those species not in the usual desert dress. The Raven is in no need of protection and never desires concealment. He does not stalk live prey, preferring carrion, and he is not preyed upon, so he has a wide choice of colours. Why the ancestors of the Crow chose black it is not easy to explain, as it entirely relates to conditions appertaining to a very remote period of the world's history. The same may be said of the black-and-white Wheatears. They find no reason to desire inconspicuous colours, as during the incubation period they are invisible and secure in a hole or cranny in the rocks. At other times they depend on their eyes and wings. Since they do not nest on the open surface of the ground like the Larks, a group particularly well matched to its environment, we have not to search for a reason for the colours the Wheatears have adopted.

It might be mentioned that the most brilliantly coloured birds that nest at any rate in Division II of the desert are hole-breeders. Such are the Bee-eaters (*Merops apiaster* and *M. persicus*), the Rollers (*Coracias garrula* and *C. benghalensis*), and the Kingfishers, the Common (*Alcedo ispida*) and White-breasted (*Halcyon smyrnensis*). All these have plumage of the brightest blues and greens, rivalling the birds of a tropical jungle, and males and females are alike. They also have another character in common with Hoopoes and Woodpeckers, also hole-breeders, that is, the eggs are white and glossy. The eggs of all desert ground-surface breeders I have seen are coloured to harmonise with their surroundings in cases where the eggs are exposed. We collected a series of eggs of a number of species of waders in Iraq and the Persian Gulf, and the only wader that laid white eggs was the only one that nests in a burrow, the Crab Plover (*Dromas ardeola*). I do not propose to carry this thesis further, as it would lead into a labyrinth of groups whose habits and antecedents are too imperfectly known to me

to permit me to prove anything. There seems enough evidence even here to allow of the statement that the colour of the eggs (not to mention the plumage) of the ground-surface breeders is not accidental, but has been developed by a power the birds possess of changing them from an original white, with a view of rendering them inconspicuous,¹ not necessarily to the eyes of man, who has not been a serious enemy to birds long enough to affect their economy in the matter of dress or egg-colour, but to the hereditary enemies they have had to contend with from the time of their own appearance on earth as birds.

We have now touched on defensive colouring, and must next take the case of birds that, although not preyed upon, but themselves predatory, are yet influenced by their desert surroundings; that is, they are paler races than their allies of the afforested regions. These are the Owls, Falcons, Merlins. I should say that it is a distinct advantage to any of these to be merged in the landscape. They all have the same habit of perching on a mound in the desert often only a foot or two high, and, coloured as they are, are very difficult to distinguish. The birds and animals they are watching will therefore be more likely to move about, and the Hawk will have a much better idea where his next meal is coming from, than he would if he had a sharp dark outline. It is also possible that these birds of prey would feel conspicuous during such watching and also during the incubating period, for, although well able to protect themselves with beak and claw, they do not wish to be disturbed from the eggs by other birds of prey and would rather pass unseen. I have noticed that trained Falcons show much nervousness

¹ Further field work on the eggs of the Cuckoo will probably support this. It is known that where the Common Cuckoo is able to lay her eggs for a sufficient number of generations among brown eggs such as those of Pipits, Wagtails, etc., her eggs have matched them. Another individual of the same species, victimising only blue-egged birds, has developed a blue egg. This theory need not be disturbed because a Cuckoo that lays brown eggs, finding no nests of brown-egged birds available, will on occasions drop her brown egg among the blue clutch of a Hedge-sparrow.

if even a much smaller Hawk, such as a Hobby, flies directly over them, and this uneasiness would be more acute during the month they were on the nest. The Eagle-Owls have on many occasions given the writer evidence of their effectual habit of squatting flat to avoid danger.

And now to suggest the means by which the development of desert colouring has been attained. It is held by some authorities that differences in the humidity of the air form the agency by which pale and dark colour differences are brought about. This is true to the extent that darker colours prevail in districts where the moisture is heavier, but it might with more justice be reasoned that because the vegetation in that district is on that account more abundant, the environment becomes less pale, and the fauna has to follow suit in order to be in harmony with it.

We have good evidence of this in the case of the Desert Lark, *Ammomanes*, a genus whose races are singularly well adapted to the colour of the soils on which they reside. Colonel Meinertzhagen when crossing the desert between Amman and Baghdad came upon an almost black *ammomanes* (*A. deserti annæ*), inhabiting a comparatively narrow belt strewn with black iron pan rock, which, from a certain similarity in appearance to volcanic rocks, is locally known as the lava belt. The bird exactly matched the dark rocks among which it lived and doubtless nested. On the sandy plain beyond the lava strip, a pale *ammomanes* (*A. deserti coxi*), exactly imitating the colour tones of the desert, replaced the dark bird. It cannot be contended that these two forms are due to humidity, as the climate is exactly the same for both. These two distinct races of the same species are the most remarkable instances of adaptation of a species to the colour of environment that have so far been observed. Another subspecies, the palest of the genus, *A. deserti azizi*, was found by me in the white chalky sandstone hills at Hufuf. Here again

the harmony of colour between the bird and the pinky-white rubble among which it resides is marvellous. Both Colonel Meinertzhagen and I brought specimens of the rocks and exhibited them beside the dark and pale birds at a meeting of the Royal Geographical Society (*Geographical Journal*, February 1925). On p. 138 of the same *Geographical Journal*, Lord Rothschild states that in his opinion the desert has a direct effect on the colour of the fauna, and he gives some interesting and remarkable instances in support of this.

It is probable that Desert Larks are of all desert birds the most persecuted. I found their remains in the pellets of Eagle-Owls, and the Merlins doubtless take toll of them. These Larks might, therefore, become more constantly anxious for their safety than other birds, particularly during the nesting period. They are also not inclined to wander far from the ground in which they were bred, and would thus spend their whole time in one colour-shade of country. *I think the development of a colour as evidenced most clearly in a subspecies is the result of an influence which I will call a subspecific desire, operating through generations of that subspecies, for that particular tone which will harmonise with its environment and render the wearer inconspicuous.* Both the need and the desire must be constant. This constancy would chiefly be ensured when the subspecies was sitting on the eggs, and we should then have the explanation why subspecies nesting on pale ground have a tendency to be paler in colour than those nesting on dark ground. Subspecific desire would not be constant throughout a race during the time when its individuals were scattered during the winter over all kinds of country, and, as I have endeavoured to show, at such times the birds need not feel the desire for any particular colour-pattern or shade, and seldom squat to make use of it. Predatory species would probably experience the desire when stalking their prey.

In the fishes and reptiles there is an influence akin to

subspecific desire, only much more highly developed and of more rapid operation, that operates for the purpose of protection.

The Trout taken from a stream with a white bottom would be a pale whitish fish; if placed in a stream, or if moved to a different part of the same stream, with a dark bottom, it would be dark brown in a few minutes. The hairless animals (the Whales) also change their colour, and there is the blush in the human being. Some reptiles also change colour very quickly.¹ I should say that a somewhat similar phenomenon, so familiar that we cease to wonder at it in other fauna, is also represented in the birds by their ability to change their plumage tones, although it is here different in character and much slower in its operation. The influence controlling the change is what I have called subspecific desire.

Perhaps the biologist can explain the means by which these harmonious colours are produced, when the field naturalist has done his part and produced sufficient evidence to prove that their existence is systematic. Although it is dangerous to introduce cases of alteration effected artificially in considering evolution by natural means, it seems excusable to notice here the red plumage of the Canary resulting from the feeding of the yellow bird on cayenne pepper.

If we are right in assuming that birds have evolved from a reptilian ancestor, then anyone who has seen a sandy *Agama* Lizard assume, when excited, the reds and blues of a Macaw will have little difficulty in accepting the possibility of the presence in birds of a somewhat similar power to change colour gradually owing to a sensation produced by fear. The ground-surface nesting bird sitting on her eggs for a month in an exposed position,

¹ The rapid change in colour in mammals, reptiles, and fish that I have mentioned is brought about by blood action in the skin, whereas those colours with which we are chiefly concerned are due to change in the feathers of birds and the hair of animals, and herein lies one of the fundamental differences between the two phenomena.

and with a plumage out of harmony with the colours around her, would have feelings as uncomfortable as those of a woman who finds herself sitting next to another with a dress that clashes in colour with hers. Provided every pair of birds in that district is affected in the same way, I believe that in the course of generations such a feeling has a definite influence, and we thus arrive at the difference in shades which enables a naturalist to distinguish birds nesting on pallid desert from their allies dwelling on darker country ; that is, he is able to give them subspecific rank.

It is already recognised that you cannot have two subspecies of the same species breeding in the same area. This is not because they would not breed, but because the two subspecies *would* breed together, and their descendants would combine the characters of colour that enabled you to distinguish between their parents. That is, the two subspecies would become one. On the other hand, species of the same genus can and do breed in the same area because they would not ordinarily mate together, as the type of one would not be attractive to the normal and healthy type of the other.

If pairing were brought about between the two species artificially, or, as rarely happens in nature, by chance, the progeny would be sterile in the first or second generation, or would be handicapped with defective powers of reproduction, and would not long survive in the struggle for existence beside the two virile species from which the hybrids originated. Cage-bird fanciers have bred mules in plenty, and some are said to be fertile, but they have not so far succeeded in producing a new kind of prolific cage-bird from the crossing of two species.

I consider that most of the differences in colour noticed to-day are the result of a long period of time, and the alteration has been as gradual as the geological and physical alteration of the globe itself. We are often

thinking in hundreds of years when it ought to be hundreds of thousands.

There seems to me strong evidence that originally the colour of all fauna was white, that is, it was colourless, and pigmentation has taken place as the various forms spread out over the earth's surface. Where unconscious or semi-conscious desire to harmonise with environment has been constant throughout a species for countless generations, we have ample proof that it has been acquired. The white phase of the Ptarmigan (*Lagopus mutus mutus*) and Willow Grouse (*Lagopus lagopus lagopus*) would approximate to the original state. As they descended the grey mountain side to nest below the snows, their white plumage made them feel conspicuous during that critical period and their desire for obscurity has produced and is producing the grey summer plumage. It is easier to maintain this view of their evolution than the reverse, that they were first grey and abandoned the coloured feathers because they spent the winter in the snows. The summer plumage of these birds is even now not wholly grey. The breast and flight-feathers remain white. When the bird is sitting on the nest, both breast and the white portion of the wing are of course invisible, and this would suggest that the desire for harmonious colour has chiefly been exerted on the essential or exposed feathers.

Anatomists have a great advantage in the study of evolution over those who study colour changes, since development throughout the ages is often remarkably demonstrated by the finding of fossilised bones, but we have no means of comparing the differences in plumage colours during the various periods in the earth's history.

We can assert with confidence that during the glacial period an arctic fauna ranged over countries that are now temperate and possibly tropical. The similarity between the flora of the Alps and the Himalaya is significant, while the bones of the Willow Grouse (*Lagopus lagopus*) and the Snowy Owl (*Nyctea nyctea*), two species

not known in France within historic times, and now belonging to a far more northerly fauna, have nevertheless been found in French caverns associated with bones of the Reindeer (*Ibis*, 1866, p. 414).

It seems reasonable to suppose that the birds left to colonise the lands exposed by the retreating snows have gradually acquired brown plumages, whereas those that have remained under arctic conditions have retained the original white. If this be so, the original Grouse would have been white winter and summer, and this form is now extinct. The nearest existing form to this is the Willow Grouse, which is in the intermediate stage, and there is yet another which has discarded the white plumage entirely, the Scotch Grouse (*Lagopus scoticus scoticus*).

The inbreeding of any species tends to produce white individuals, whose condition need not be true albinism, inasmuch as it is not accompanied by pink eyes. I should consider all these white sports as a throw-back to the original white ancestor. Albinism and partial albinism are prevalent in birds that are likely to be inbred—hand-reared Pheasants, Blackbirds, Sparrows, and Swallows. Personally I look upon true albinism as reversion to the original type (in spite of slight difference in pigmentation), in the same way as the appearance of a dun horse with a dark stripe down the back from ancestors of other colours is a throw-back of less remote extent, through many generations, to the wild horse.

In the books of several authors who have discussed the problem of colour protection with all the weight of field experience to support their philosophy, one reads an attack on the cases of birds and animals in the Hall of the Natural History Museum, in which the pelage and plumage of various species are exhibited with the object of showing the more remarkable instances of colour-adaptation of a fauna to its surroundings. The chief criticism against these groups seems to be that they are misleading, because, whereas the specimens are motionless

in the Museum, when seen alive in the field they move about and lose the benefit of any protection they might derive from their colouring. Personally, since I saw these species (of the Desert cases) in their native lands, I must confess that my interest in the Museum groups has increased, and I seldom pass them without gaining some information and suggestion from their study. Once we realise that when a bird or an animal is moving, protective colour ceases to operate as such, and never was intended by nature so to operate, we start with a much more workable theory, and may carry on our study after leaving the above cases by taking a walk down the long gallery, where groups showing the nests of ground-surface breeding species, such as Game Birds, Ducks, Waders, and Nightjars, etc., will give further food for thought.

That birds are well aware that their invisibility ceases when they move is often demonstrated. The active young of ground-surface breeding species "freeze" immediately the mother gives her warning note. They do not run about, trusting to their resemblance to the ground to protect them. They are also aware that to be still before the eye of a foe is focussed upon the ground is of more value than to try to become invisible after they have been located.

I have noticed that squatting Owls and Nightjars almost close their eyelids when approached, which seems to show that the birds realise that the eye, the most conspicuous mark about them, is likely to attract attention unless hidden; and this would also indicate that squatting is partially a reasoned proceeding and not merely an unconscious response to an inherited habit.

The photographer who follows birds into their breeding-grounds will throw more light on colour theories—providing he also notes the tones of their environment—than the sportsman who tracks them in their winter quarters with a gun.

ANIMALS

In considering the question of colour-change and the possibility of the originals of all fauna being white, we get more confirmation from the mammals. The Polar Bear is, of course, white in summer and winter. There seems little doubt that his ancestors were white, and as the race has desired no change it has retained that hue. The Stoat, however, has arranged a brown phase for summer when the snows have gone. This would indicate a desire for obscurity for offensive purposes only. The brown coat is still of such an unstable description that it is no unusual sight to see a white Stoat in winter in the south of England, where snow seldom lasts more than a few days and where the white coat is more of a drawback than an asset on the brown ground. Apparently we have in the Stoat an interesting example of the colour-change in a fauna colonising the lands left by receding snow. It is important to realise that the white coat is not produced by colour-change in the brown hairs, as was once accepted, but, as might be expected, by a moult and change of coat as in the birds.¹ The original animal was white like the Bear both winter and summer. The brown coat has been developed in summer by the desire of the animal not to be conspicuous, and in the north the brown regularly changes to white in winter, where snow can be relied on for a length of time to make a white coat desirable. In the south, where snow diminishes, we have the same creature struggling to throw off the white and retain a brown coat winter and summer, and by far the majority have already succeeded in doing so. If the original coat were brown, there is no clear reason why the occasional white winter coat should occur in the south of England from parents with well-established brown coats. The white Ferret with pink eyes is probably a throw-back to the original Polecat, the result of

¹ *Morphologische Arbeiten*, Dr. G. Schwalbe, Band II, p. 483, Jena, 1893.

inbreeding. Stoats, Foxes, and Hares are among the creatures that have a white winter phase, and they all squat when stalking or being stalked. It is by the theories of a white ancestry and subspecific desire that we can account for the white underparts of nearly all desert animals and many others, more particularly those that move close to the ground. The small rodents and Hares of Jabrin had changed their back colours to the most delicate shades of desert colouring, and there can be little doubt that this has been brought about, as in the birds, by a subspecific desire for invisibility all the time they are motionless. But this desire has not been felt or exerted with regard to the underparts, which have remained white. Why should the English Hare differ from the Arabian on the back, and each separately resemble the tones of its environment, and yet be exactly the same colour underneath—that is, white. The Stoats in brown summer pelage are still white underneath, and so are the Jerboas and Gerbils of Arabia. This peculiarity ranges through many very different animal groups and is even seen in the flat fishes, where the upper surface is protectively matched to the sand, but the under surface is pure white.

In addition to the pale desert and the white arctic colours, there is another colour adopted by a number of very different genera of the small rodents in well-defined areas in widely scattered countries. This is a beautiful blue-grey. It would be out of place to discuss this here, as this colour does not appear in deserts, and there is not sufficient field evidence as yet to suggest its reason or origin; but any general investigation of colour among fauna would have to include this important colour group.

As protective colours are not modified with reference to our human eyes, we can only guess at the effect produced on the eyes of the animals for which they are intended. The fact that both the diurnal and nocturnal Gerbils and other desert animals have affected desert colours seems to imply that the eyes of Owls and Foxes

are equally baffled by this at night, as we know Hawks and Eagles are by day, or rather that fear followed by desire is equally in evidence in the nocturnal rodents. Among the countless forms and colours inhabiting the globe there must be numerous cases of accidental harmony with environment. It would be a mistake to try to apply the theory of protective colour to all creation on account of this.

The Antelopes and Gazelles would not be included by me among protectively coloured groups, since firstly they roam over countries varying in shade, and it would be impossible to obtain constancy of desire to harmonise with several different environments. Compare their conditions with those of a species of Gerbil whose tribe spends its existence in one group of sandhills. Secondly, they never squat or keep still or try to avoid their enemies by concealment. Therefore I conclude that their colouring, along with that of Zebras and Giraffes, which according to the observations of naturalists are always restless, is the result of natural selection, desire for any particular colour having been little exerted. The Lion stalking his prey in the open veldt must often feel the desire for concealment, and I should be inclined to think that his colour has been evolved by subspecific desire. If natural selection were the sole influence operating, the Lion should be conspicuously marked. We see obsolete spots on young Lions. If the desire for inconspicuous colour, which has predominated, had been eliminated by life in thick jungle, as in the case of the Tiger, the natural preference of the tribe for these spots would, I think, have produced a dark spotted skin.

The Leopard is yet another case of colour adaptability. The Leopard of the African and Indian jungle country is very heavily spotted on a sand-red ground. The Asia Minor and Persian subspecies of sparse forest land, *Felis pardus tulliana*, is more slightly spotted on an almost white ground (with longer hair), and the Ounce or Snow

Leopard (*F. uncia*) is quite white in ground-colour and has not developed spots of anything like the same number or darkness as the Indian species has.

CONCLUSION

In my opinion a species has been formed by evolution from a genus, one or more branches of which have developed anatomical or structural alterations, owing to difference of food or method of life, or some similar cause. Subspecific desire and natural selection would both operate at the same time, and either of these would affect the colour of the various species, so they might vary considerably from each other and from the original ancestor in this respect as well as in structure.

Two species breed in the same area, but in nature do not breed one with the other, partly because the opposite sexes of different species are unattractive to each other, and partly on account of the sterility or partial sterility of the offspring where abnormal cases occur.

A subspecies or race would be the result of subspecific desire and natural selection alone acting on the colour of a species, forming one or more geographical races of that species as it spreads over and breeds in country of varying shades.

A subspecies would breed freely in nature with a different subspecies of the same species, and the progeny would be as fertile as the parent stock.

In a family where no need or desire for harmony with environment existed either for offence or defence, more particularly in birds during incubation, natural selection would be the paramount influence at work (as in the case of hole-breeders), and bright colours and equality of colour of the sexes would predominate. But where conspicuous colour would jeopardise the success of the tribe, as in most ground-surface breeders, the subspecific desire would be the most powerful, and we see more sombre

males and females where both take part in incubation, and sombre females and bright males where the male does not take part, and bright females and sombre males where only the male sits on the eggs and takes care of the young.

I have limited a correctly recognised species to structural differences with or without colour difference, and a subspecies to colour difference only.

Therefore I hold that a separation effected on measurements should always be worthy of specific rank before it is recognised. Where the difference in size is so slight as only to warrant the creation of a subspecies, the bird should be left with the typical form, unless there is also enough difference in colour to merit a distinguishing name as a geographical race.

In the field a difference in note, flight, and form is often recognisable between species, but never between subspecies as far as my experience goes.

The subspecies is the creation of the field naturalist. A cabinet naturalist must depend on the label in the first instance in separating a geographical race, although, when once defined, individuals of a good race can usually be placed geographically by colour alone.

My definition of species and subspecies would correct several names with which I am in disagreement. For instance, the Chaplain Crow of Iraq (*Corvus cornix capellanus*) would become a species, and not a race of the Hooded or Royston Crow (*Corvus cornix cornix*), as it is at present. The Chaplain Crow is much larger and paler than the other and is resident on the plains of Iraq, *i.e.* throughout winter and summer it seldom wanders from the date-palm area of the Tigris and Euphrates valleys. It is joined in winter by its darker relative, the Hooded Crow, which always leaves in the spring to breed in the high Persian plateau hundreds of miles away—where the Chaplain Crow is never seen—and it would be safe to say these two forms never interbreed. I feel that

the difference in size and great disparity in constitution that must divide a resident from a migrant should merit a wider separation than the subspecific.¹

Another of the Crow tribe I often met in Arabia, the Desert or Brown-necked Raven, now called *Corvus corax ruficollis*, should surely be a separate species, *Corvus ruficollis*. It is in size and build and in its long light bill much more like a Rook. Yet the name as it stands implies that it was evolved from *Corvus corax corax*, the English Raven. It seems quite as likely that it most nearly resembles the original *corvus*, or even that *Corvus corax corax* has been developed from it. It happened, however, that by chance *Corvus corax corax* was the first to be found and christened by modern man, and therefore under the present system it becomes the typical form, although it might be the youngest branch in the evolutionary tree. The same applies to *Bubo bubo desertorum*, the Desert Eagle-Owl, the name suggesting that it was evolved from, and is a geographical race of, the big dark Eagle-Owl of Europe (*Bubo bubo bubo*), although *desertorum* is smaller and much paler. Had the pale desert bird been brought first to Linnæus, the European bird would have been a subspecies of *Bubo desertorum desertorum* instead, regardless of anatomy or any claim it may have to greater antiquity as a separate tribe.

Another bird I consider as a well-defined species is the Eastern Yellow Wagtail (*Motacilla flava campestris*), which is now classed as a race of the Blue-headed Wagtail (*M. flava flava*), although one has a yellow head and the other's is blue-grey, besides other differences. The Eastern Yellow Wagtail may be a race of the Western Yellow Wagtail (*M. rayi*), but is poles apart from *M. flava flava*, which has its own blue-headed races.

It would seem that a task that will fall to the scientist

¹ There is no proof so far in the cases where, as Seebohm found in Siberia, Hooded and Carrion Crows interbreed, that their progeny go much further than the results of the first cross. The scarcity of intermediate examples or hybrids seems to indicate that they do not.

of the future will be the re-arrangement of to-day's classification to bring the true divisions of the forms and their present nomenclature into agreement, placing the ancestral form in its position as the typical, according to the evidence of the anatomist, the indications given by fossilised remains, and so forth. Fortunately the present system is the only one along which progress is possible for many years to come.

The Reptiles and Insects of the desert have received no mention in this chapter because I have had little opportunity of studying them; nevertheless the mimicry and colour harmonies of both have reached a high stage of development. The *Agama* Lizard with its rough gnarled skin exactly matches the stones, as does the Praying Mantis, and they both squat to make full use of the resemblance.

It appears that no attempt has been made by insects to acquire invisibility of colour while in flight or in motion. The upper wing surfaces of Butterflies are often gaudy and conspicuous, and these colours are only shown when they are either active or able to seek safety in flight. On alighting to sleep and during periods of torpidity, the wings are closed, and striking examples of protective or assimilative colours on the under-surface come into operation, and certainly give the insect the advantage of disappearance into its environment. Moths come to rest without closing their wings, and, in contrast to the Butterflies, many have developed assimilative colours on the upper surfaces. One Locust in particular is plentiful in deserts and has brilliant scarlet wings that attract attention during its short flights, but the insect's apparent disappearance on alighting is both sudden and effectual.

It is significant that animals and birds that crouch or squat for offence and defence in the open are those that have the highest development of protective colour. The Nightjars are among the best examples. Not only are

they exposed during the incubation period, but during most of the year they squat in open ground during the day, with imperfect vision, a disadvantage experienced by few other groups of birds, and it is reasonable to believe that their unusual conditions of life and wonderful colouring must have some connection.

I may say in conclusion that the idea of "subspecific desire" came to me in the desert while I was examining and pondering over the problems daily encountered there, and as I had not at that time read the opinions of any other students I was not biased by preconceived ideas. Since then I have read the works of the best-known field naturalists, among them *African Nature Notes and Reminiscences* by Selous, and find that I agree with the conclusion he came to as regards environment, with this difference, that he considered the environment in some way influenced the colour of a fauna, whereas I have gone further and have become convinced that change of colour has been produced by the animals themselves, owing to a conscious or semi-conscious power that they possess of developing colour tones by very gradual process over a long period of time, this power being exerted in the direction of harmony with environment. The desire which influences the power is most acute at the time of incubation in ground-surface breeding species of birds, among which the most remarkable cases have been produced. It also operates in lesser degree at all times, such as during the stalking of prey or squatting for concealment, and takes effect if the desire is uniform and constant throughout the tribe.

Desert colour must not be confused with bleaching, which is due to the sun's scorching rays and is entirely different, frequently affecting the old plumage and coats of birds and animals of the desert. Blacks under its influence turn russet, as in the old feathers of the Raven and the black hairs of the Ratel, and most other colours merely fade.

Although it is tempting to draw comparisons, I think that variations, called "breeds," in domestic animals such as cattle, dogs, poultry, and pigeons should not, in view of the artificial manner of their origin, be mentioned in arriving at conclusions in regard to natural evolution. A natural species is not derived from an accidental variation from type in a few individuals, but is the result of some external influence acting on each member of the tribe, such as a new method of transport, more use or disuse of limbs, or change of food, added to natural selection. An accidental variation in one or two members would not survive in the progeny through more than the first or second generation in nature, owing to crossing with the typical forms. The difference between this and domestic breeds is that members of the latter showing the accidental variations which please man's fancy are able to perpetuate these characters only because of their careful isolation by man, who allows them to breed together and prevents them from breeding with typical examples of the original class. Through however many generations this may be continued, there seems no evidence that there would ever be the difference that exists between two species. The two breeds will, in fact, remain the same. Different breeds seem to me no more different specifically than a big dark man and his small red-headed brother. A red-headed tribe of man could be produced in a few generations if only red-headed people were allowed to breed, and the dark-haired children were removed from the colony and replaced by red-haired children. Yet these people would not be a different species, nor would they be on the way to forming one. The difference between breeds on the one hand and genera and species on the other is in my opinion proved by partial or absolute sterility. The Saluki or Gazelle Hound has been a pure breed for several thousand years, as is proved by ancient sculptures, yet if crossed with a Bulldog the progeny would be as fertile as either of the

original breeds, or even more so, and in my opinion it would be equally fertile and prolific after 100,000 years.

Imagine, if possible, the Bulldog and Saluki as being produced by natural evolution from the Wolf by the special needs of the two branches in obtaining food. One point is that they would have taken hundreds of thousands of years to acquire such differences instead of a few generations of artificial selection, and another is that they are so different in skull and all proportions that they would be worthy of consideration as separate species, if not genera. Animals so different, if crossed, would, according to the laws of nature as we know them, produce young either sterile or with defective generative powers.

It is true that Darwin took the domestic breeds to illustrate his theory of the origin of species, but he had first to convince an incredulous world that there was such a thing as hereditary variation, and here was an example easily understood by anyone. He could not have regarded the analogy as perfect.

CHAPTER XIX

DRINKING AND WATER PROBLEMS

THERE are times when desert fauna have to get along with very little water, and some forms seem to have solved the problem of existence without actual drinking, and can obtain a sufficiency of moisture in other ways. At one time I imagined that every form of life found in waterless deserts must be specialised in some way to be independent of the necessity of drinking; but since my journey to Jabrin my views have been considerably modified. The conditions under which creatures live in these regions is a subject that for obvious reasons has received little systematic study on the spot, and one cannot even compare one desert with another, because the meteorological factors of one or both are unknown. In the Jafura and Jabrin deserts rain is of uncertain appearance. It was, at the time of my visit, six years since good rains had fallen. By a "good rain" the badawin means a shower or showers that leave pools of water standing in hollows where an impervious subsoil makes such a thing possible. The winter before my arrival no rain had fallen at all, and during the previous years there had only been a slight fall, and this in an area where there are no summer rains and where half an inch per annum would be considered sufficient. The forms of life that have succeeded in establishing themselves on these wastes can be only such as are independent of rain for long periods.

The sand-dunes were found to be surprisingly fitted for making the most of these small supplies; that is, they not only absorb it at once but retain it at a short distance below the surface and resist the evaporative action of sun

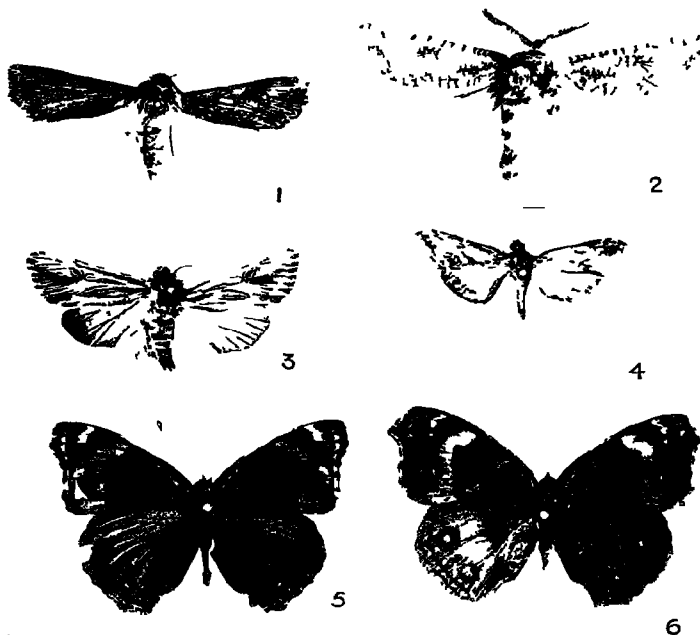
and wind. The moist layer is by this means favourably placed round the roots of plants, which burst into leaf and flower, and make the moisture accessible to the fauna through the young shoots and fleshy leaves. Evaporation on the gravel plains seems more rapid and vegetation is correspondingly scarcer. Only one plant, the *Arfaj*, seems able to colonise this ground with any success, and it grows chiefly in hollows where a bigger proportion of sand is manifest.

The succulent leaves are a feature of several families of the desert flora. Those of *Zygophyllum album* and *Suaeda vermiculata* in particular bear a strong resemblance to bunches of small green grapes. Since rainfall is insufficient, we must turn to the only other source of moisture supply, that is, dew, with which must be bracketed fog, although in a more exhaustive examination of the subject they would require to be treated separately, as there are mornings when a heavy dew is precipitated without any accompanying fog.

The first time I realised the extent to which plant life in desert country is dependent on mist was on March 16, 1921. We had run for shelter during a high sea into a small bay in the Persian Gulf called Khor Khawi, amid the volcanic mountains of Ras Masandam that towered above us on all sides. It is quite waterless and uninhabited and uninhabitable country, yet the scene around was one of mysterious enchantment. Deep down in the clear, blue water of the Persian Gulf could be seen a garden of delicate shades of colour with feathery branches of coral covering the bottom, while fishes of still more brilliant hues swam over them. Launching a jolly-boat, we rowed to a small creek, landed, and were surprised to find the hill-sides well clothed with bushes. These coastal districts certainly get more rain than the deserts inland, but the annual rainfall is very small. The vegetation was all of the peculiar, drought-resisting orders, and, on breaking off an apparently dry twig of one, *Euphorbia larica*, we found



65 MIST AT DAWN IN KHOR KHAWI, RAS MISANDAM.



66. 1. *Agrotis saracenica* Tams, sp n, ♂
 2. *Cossus cheesmani* Tams, sp n, ♂
 3. *Tricocblea avempacer* Tams, sp n, ♂. Enlarged
 4. *Noctuella avicennae* Tams, sp n, ♂. Enlarged
 5. *Precis orithya cheesmani* Riley, subsp n, ♂.
 6. Ditto, ♀.

[To Illustrate Appendix V]

What a stream of milky fluid flowed freely from the stem. Next morning enlightenment came, for at dawn we were enshrouded in a heavy bank of fog, and everything on board ship was soaked. As the sun rose and dissipated it, the last columns of mist could be seen moving among the ravines like huge bales of white cotton-wool (Plate 65). It left little doubt in my mind that the vegetation was mainly supported by water assimilated in this form. On the tops of the hills goats could be seen through field-glasses, whether the wild "Thar" or in a state of semi-domestication it is impossible to say. The bushes were often grazed quite close by them. These animals would have been quite unable to exist on the rocky hillsides were it not for the mist-fed vegetation.

The next cases of mist are different, as they were experienced inland in places beyond the direct influence of sea fogs. On December 9, 1923, a cloud of fog was chronicled in Hufuf, forty miles from the coast. At sunrise objects three hundred yards distant were invisible, but the rising sun dispersed the fog—shade temperature 59° F. On December 28, in the same town, at sunrise, shade temperature 50°, a cold fog was hanging over the town and was dispersed in an hour. On January 23, temperature at sunrise 63°, clouds low, a fog hung over the town with occasional spatters of rain. On January 31, I noted temperature at sunrise 66°, slight fog in town. As these observations were made in a house, it was not possible to notice the occurrence of dew, but it would be safe to assume that most windless days at dawn throughout this period would be accompanied by a precipitation of dew on the desert outside the town.

On February 11, in the sand-dunes of Jafura Desert, eighty miles from the sea, the wind had dropped during the night, and we were visited by very heavy dew, which not only soaked our kit, in and outside the tent, but saturated the sand to a depth of half an inch. The shade temperature at dawn was 48°. The dew came without

a cloud in the sky, and there was no mist. The wind had been from the north, and in that direction the sea would be about one hundred miles distant.

On February 15, at Zaida Jafura, another eighty miles south of the last locality, in the same desert, a heavy white fog was covering the sandhills; we could only see one hundred yards, and there was a heavy dew as well. As I stood with my back to the rising sun, a white rainbow could be seen reflected on the fog close to me. All bushes had dewdrops hanging from the branches and dripping to the ground, and the sand around was pitted with the marks.

These are the only dews noted in the diary, but, had there been more opportunity for close observation, there must have been many more days on which dew of a lighter description could have been seen on the bushes in the early morning. After the hot sun and wind of the day had dried the surface of the sand, the dew was found by scratching away six inches from the top, where a dark layer of moisture-saturated stratum was underlying.

Another feature connected with the dunes and conservation of water was seen in some roots of a rush-like grass sometimes exposed by the wind that had swept away the sand. These roots were thin and wiry, but at intervals of an inch or so were swollen out to round protuberances, like small potatoes. The roots and underground stems of the two parasitic plants, *Cynomorium coccineum*, "Tarthuth," and *Phelipæa lutea*, "Dhanun," are much more distended and more succulent than the flower stem above ground.

Any animals and birds could have drunk their fill from the dewdrops on the bushes on the morning of February 15, and this fact alone makes it difficult for me to advance any theory as to whether the various species seen are able to exist entirely without water or not. It seems that many kinds utilise this part of the year for "touring" to feed in parts of the country which would be denied to them during

the rest of the year owing to the absence of water. This is a well-known habit, not only with the nomad Arabs themselves, but with the Sand-grouse. It is very noticeable on the banks of the Tigris, where, during the summer, both the Pin-tailed (*Pterocles alchata caudata*) and the Spotted Sand-grouse (*Pterocles senegallus*) live on a certain ground throughout the summer, and drink at the river regularly twice a day. Towards the end of the season it is conceivable that food must be getting short on these crowded lands, and the first shower heavy enough to leave water in hollows marks the departure of the birds for pastures new; where, independent of the river, they are free to wander at great distances from its banks. This, to a certain extent, would direct the movements of birds in any desert, and the small parties of *Ammomanes*, the Desert Lark, that I met in the waterless desert, I feel sure, were only "touring" during the period of dews. For how many months in the year dew does fall it is not possible even to guess, as there is no information.

I had previously formed the opinion that *Ammomanes*, although they like bare, waterless hills, are always found within reach of water. This theory was founded on three very strong cases; first on a former journey into the Pushti-Kuh mountains in Persia in late summer. In the foothills everything was scorched and dry. When we came to wells where shepherds watered their flocks, every *Ammomanes* for miles around was concentrated round these spots, and the troughs, immediately after the sheep left, were lined with drinking Desert Larks; and the same sight was witnessed at all the wells there. The next case was on a journey from Oqair to Salwa, a waterless march of sixty miles, but at Abu Muharra we came on a well that the men were not aware of, with water in it. That evening I shot my one and only *Ammomanes* seen on the trip. The third case was in Hufuf. I had seen the little domed building or bath-house built over the well Ain al Najm out in the desert, and about half a mile from a bare, water-

less hill, Jabal Abu Ghanima, and, having formed this opinion of *Ammomanes*, and hoping to find this genus in Hasa, I made this well my objective and told the men what I was after. They had not tied our horses up before I heard the bird's whining call and saw one of them seated on the top of the building. Hastily warning the men of my intentions, I shot over their heads, and when they picked up one of the beautiful, cream-coloured Larks that are now named *A. deserti azizi*, exactly what I had told them we should find, and exactly in the position I had named, their amazement equalled my delight. I shall now want a lot of convincing that *Ammomanes* need not drink.

The water in this well was completely covered in, and the birds could only have drunk by entering the bath-house by means of the gaps in the ruined walls. The *Ammomanes* seemed to have acquired special habits to satisfy their thirst. That is, in the case of deep wells, they wait for the badawin to water their camels and know that a certain amount will be spilt or left about for them. Finding their way into a building to drink must be considered an acquired habit, and argues a strong sense of smell of water.

The majority of isolated wells in deserts are about twenty feet deep, and the top is usually small to prevent sand blowing in. It would be difficult for a bird to get into these, drink, and return without getting drowned, and their waters are therefore only made accessible by the help of man. Norfolk Plover (*Burhinus ædicnemus*) came regularly to the well at Salwa to drink in the evening. The habit seemed to be well known to the badawin, who told me of it, borrowed my gun, and lay up for them and shot one. This could have been no chance visit. The well differed from the usual type; it was only five or six feet deep and was easily accessible to birds. I certainly saw this Plover's footprints eighty to a hundred miles from water, but that is not much more than an hour's flight, and,

as I have already remarked, there were morning dews at that time.

The *Alamon alaudipes*, or Bifasciated Lark, seems, however, never so far to have been detected taking any interest in water. At Zarnuqa well, where our camels had been drinking and had left some water in pools, I saw one of these Larks running towards the well and watched, thinking it was coming to drink. But it ran quite close to the water, passed it, and went on beyond, its sole interest being centred on some kind of insect that it digs for industriously in the sand.

It is remarkable how much of the vast sand-dune deserts is quartered by them daily. Their tracks are straight from bush to bush, each foot exactly in front of the other, and almost every bush seems to have been visited. I have an idea that, apart from a possible drink of dew, these birds take no water, but it is based on very scanty evidence—chiefly because they do not drink when water is available, and they are not wont to move much from their particular beat, and because I have seen them in Iraq in hot summer days far from water. Short-toed Larks are very different. They could be seen any afternoon in Hufuf flying across country in flocks to one of the big seepage lakes, drinking and returning with business-like regularity.

The Ostrich cannot have much opportunity of drinking in the waterless plains and deserts of Arabia in which it lives; there would only be the dew. Yet the two that were sent alive by the Sultan of Najd to Sir Percy Cox used to drink regularly from a tin of water, taking a mouthful and then raising the head to let it run down the throat as though to the manner born. These birds had a strange habit of pecking at anything hard and shiny and then going through the motion of swallowing, although, of course, there was nothing to swallow. The same habit can be seen in the African Ostrich, and it is a recreation of which they never tire. It appears quite

possible that this strange trick has some connection with their method of collecting dew from the bushes, and it is difficult to account for it otherwise.

Colonel Meinertzhagen has noticed the Wood-Pigeon in London parks drinking from the dew-laden grass, and in the Syrian Desert found the crops of desert birds, shot in early morning, full of water.¹

The animals are more confined to the place of residence than birds, and we are on safer ground when we say that the majority of those mentioned in the Mammal paper, Appendix I, are entirely dependent on dew and the water contained in the plants on which they live for the moisture they require. The Oryx owes its continued existence in Arabia to its ability to live in places that are inaccessible to the badawin on account of their waterless character. The hunters of the Oryx, indeed, have to depend on camels' milk, and the extent of the journeys is limited to the time that their camels can exist without water. Yet Mr. Seth Smith informs me that the Arabian Oryx in the London Zoological Gardens does drink on occasions, but only very rarely.

Here let me warn travellers who contemplate long, waterless marches that the statistics as to a camel's endurance are mostly derived from imaginative badawin by over-credulous travellers. It stands to reason that, if grazing camels can last two months without water, the whole grazing of the Great South Desert would be utilised every year, and that it would be crossed by trade routes in several directions; but neither is the case. Even the Al Murra, who have nothing to learn about bare living or desert-craft, confess they can only utilise the vegetation round Magainma, which is five days south of Jabrin, in years of exceptional rain, because it is only then that they can find water in Magainma wells. At other times they have to be based on Jabrin wells, and that means that three or four days out, and three or four days back, or six to eight days

¹ "Journey across the Southern Syrian Desert." *Ibis*, January, 1924.

without drinking, is the limit they are prepared to allow their camels to go without doing them harm. On raids they would possibly be prepared to risk as much as double. Round the camp fire, when there was no immediate likelihood of putting their statements to the test of actual proof, I should expect to hear most fabulous stories of the camel's powers of abstention; but I should neither be rude enough to contradict, nor rash enough to believe them, and feel sure that, if it were seriously suggested that the raconteur should undertake just such a journey as he had described, a most excellent reason would be forthcoming for an indefinite postponement.

In much the same way a camel's speed over long distances is often recited; but what actually happens on an Arab journey is that the first day is spent in covering a respectable distance, and the second in looking for his lost camel, which, however, is not allowed to spoil the average by inclusion in the calculations. My longest journeys were two marches of six days each in which the camels did not drink. The time of year was early spring, and on most evenings they were able to browse for two hours on the young shoots and leaves of the sprouting desert scrub, and on several mornings heavy dew was noted. Although possibly the grazing would have been more luscious a month later, the conditions could not be called bad for these arid deserts; yet, towards the end, the camels were considered to be tiring because they were thirsty, and we were able to gauge that thirst in the case of the two first to arrive at the well by counting the buckets and estimating that they consumed from nine to twelve gallons each. When they were near wells and were drinking daily, some of them hardly swallowed any; for others two or three gallons sufficed. Muhammad Hasan said at Jabrin that he hoped the camels would not eat too much of the plant called *Sawad*, as it was "hot" and made them want to drink often. *Sawad* is, strangely enough, one of the bushes with very juicy leaves which are supposed

to be a substitute for drinking among the desert fauna, according to some theories. It seems unlikely that a camel-master would be at all concerned about what his beasts ate before a six days' waterless march, if they could go for two months without water.

My opinion at the end of our six days' march was that the camels, though thirsty, were not distressed, and that they could have lasted double that time without serious consequences; but it is hard to believe that, either marching or grazing, they could have gone without water for ten, or even five times as long.

Hassanein Bey, in describing one of the first stages of his long journey in the Libyan Desert, says he started on March 15 from Jalo to Zeighen well, a distance of about 250 miles, reaching his goal on March 26, and describes it as a long, waterless trek in which "one camel died and two others were so exhausted that they were to fail us soon."¹ This was only twelve days, and the cattle were fresh.

My total waterless distance occupied twelve days with a break and rest and drink at Jabrin at half-time. Yet our camels were getting tired towards the end, and one had fallen out and was saved by leaving a man behind with it so that it could come along at its own pace.

On the journey to Salwa in 1921, although it was estimated we should gain the wells in about four days, the men considered it carefully from the point of view of the camels' going thirsty; but it is true that an absence of food was also considered likely in this case. When we were near the sea-coast my camel walked towards a pool on the beach and I, having read somewhere that camels drank salt water, did not check it till the excited yells of the men informed me that it would be harmful.

The men gave the camels a drink from our water-skins at about half-way on that occasion, the third day from the start. All these cases tend to show that stories of camels

¹ Hassanein Bey: "Through Kufra to Dafur." *Geographical Journal*, October, 1924.

going for long periods without water should be sifted very carefully by anyone seriously contemplating a long-distance trek across unmapped waterless desert.

My Al Murra guide said that there were men of his tribe who had crossed the corner of the Al Rimal or Great South Desert to Najran, a journey which occupied a month; but this would not necessarily mean a month of hard travelling without water. In certain years, we know, they can find water in the wells of Magainma (and we can be sure there are wells unmapped but known to the badawin) before reaching the oasis of Najran, so that the longest waterless part, providing a rainy year were chosen, would probably be a little over three hundred miles—fourteen or fifteen days.

The Wolf gave me one proof that they can hardly be said to be independent of water, as in Wadi Sahba one risked its life to enter our camp and steal a water-skin; and I think we may say that, though they cover vast waterless regions in search of food, they have to return periodically to drink. This case also pointed to a high development of the sense of smell of water. There were skins of dates, had he wanted food, but his attentions were centred on the water-skins, as was evidenced by his foot-marks. The Ratel is a bow-legged, slow-moving creature, and beyond the fact that it prefers the most arid wastes, little is known of its habits; its occurrence in the Jafura sand-dunes would suggest its inclusion among the non-drinkers, and that it must be dependent on dew and what moisture it can obtain from its carrion food. Yet the question of its food-supply in a place like the Jafura presents a greater problem than does the water. The badawin say it lives on human corpses, but it was a far cry to the nearest cemetery.

The rodents—that is *Gerbillus*, *Meriones* and the Jerboas—cannot ever see water in pools in the places they inhabit, and must depend on dew. The Jerboas I kept in a cage in Basra used to drink by dipping their fore-paws in water

and licking them. During the hottest hours of the summer days—perhaps 110° in the shade—they would lie stretched out and quite as completely dormant as an English dormouse in the cold weather.

The rodents in Arabia would spend the day in the underlying strata of sand containing most moisture. During the winter Nature provides them with ample water in the shape of dew at their door, and there are the fleshy leaves on which they feed. During the summer we can only surmise that they have to get on with less moisture, and they may sleep through the hottest hours of the day and avoid excessive evaporation. I examined the stomachs of many of these creatures. Their food was too finely masticated to be recognisable, but in all cases it seemed to be leaves of the desert scrub and it was invariably in a state of moist paste.

The English Rabbit is a familiar case of a non-drinking animal. I have never seen or heard of a Rabbit going to a pond to drink. Their food contains a much higher percentage of moisture than that of the desert mammals, and rain and dew are more abundant, but the fundamental principle seems to be the same.

APPENDIX I

MAMMALS

IN a list of Arabian mammals of the eastern side of the peninsula mention must be made of the Whales, although very little has ever been recorded. At least one species of the bigger Whales pays annual visits to the sea on the coast of Hadhramaut and to the Persian Gulf. Blanford in his *Eastern Persia* identified it as *Balenoptera indica*.

It might be assumed that these Whales come from the South Polar regions to breed in the warmer seas. On the other hand, in November, when I saw them, they ought to have been in the south for the Polar summer. If they are from the north it is not easy to explain their annual journey into a sea that is landlocked northward. Sir Arnold Wilson has drawn my attention to old references to Whales in the Persian Gulf by both Arrian and Strabo, and that in which Arrian mentions that Nearchus' sailors measured one of 50 cubits, and he has heard that as recently as October, 1921, six Whales had been stranded on Kishm Island. I have extracted three records from my own diary: October 26, 1923. Whales plentiful three miles from the Hadhramaut coast between Mukalla and Ras Fartak; on the next day more were seen some 200 miles nearer Oman, and on November 1, 1923, three Whales were observed spouting in Bandar Abbas harbour.

A systematic collection of data on their arrival and departure from these waters, the identification of the species, and some record of their number if more than one is observed, would produce valuable results.

The Porpoise is also numerous and extends the whole length of the Persian Gulf. It is almost a daily event to pass a large patch of rough water caused by hundreds of small dark Porpoises, either young or of a very small species, and all more or less of one size. They leap from the water in schools, but do not play in front of the bows of a ship as the larger individuals do. Porpoises and Dolphins are synonymous. Although the name

Dolphin is generally acceded to the species with the longest snouts, this feature intergrades throughout the whole family. The Whales and Porpoises can be distinguished from the large fishes by their horizontal tail. The tail-fins of all fish likely to be confused with them are perpendicular.

The best-known of the marine mammals is the Dugong, the "Mermaid" of early voyagers in the Indian Ocean. Specimens have been secured at Aden and other places in the Red Sea. They belong to the order of Sirenia or vegetable-feeding Whales, do not grow to a great size, and frequent shores and bays in preference to the high seas. Their habit of raising their round heads out of the water and of suckling their young and carrying them under the fore-fin gave rise to the legend of a being half human and half fish. The range of the Dugong extends from the Red Sea to North Australia. For a small consideration credulous travellers are still shown these creatures preserved in glass cases at some of the Red Sea ports, any deficiency the human-like half may have in its resemblance being amply made up by the decorative resources of the taxidermist.

It has been considered of sufficient interest to add a list of the animals mentioned in the few papers existing that deal with South and South-eastern Arabian mammals.

"On Five New Mammals from Arabia and Persia," by O. THOMAS, *Annals and Magazine of Natural History*, Ser. 7, Vol. X, December, 1902.

Genetta grantii, Grant's Genet and *Meriones buryi* (both from S. Arabia); *Vulpes vulpes arabica* (Arabian Fox from Muscat).

"On some Specimens of Mammals from Oman, S.E. Arabia," by O. THOMAS, *Proceedings of the Zoological Society of London*, May 1, 1894.

Xantharpyia amplexicaudata, Fruit Bat.

Taphozous nudiventris, Sheath-tailed Bat.

Rhinopoma microphyllum, Long Wire-tailed Bat.

Erinaceus niger, Black Hedgehog.

Crocidura murina, Shrew (Musk Rat).

Herpestes albicauda, White-tailed Ichneumon.

Canis pallipes, Indian Wolf.

Vulpes leucopus (now *arabica*), Arabian Fox.

Gerbillus (*Dipodillus*) *dasyurus*, Naked-soled Gerbil.

- . *Mus* (now *Rattus*) *rattus*, Black Rat.
- Lepus omanensis*, Oman Hare.
- Gazella muscatensis*, Muscat Gazelle.
- Oryx beatrix*, Arabian Oryx.
- Hemitragus jayakari*, Thar or Wild Goat.
- Procavia syriaca jayakari*, Rock Dassie.
- Tursiops tursio*, Bottle-nosed Dolphin.
- Grampus*, sp., Risso's Grampus.

"On the Mammals of Aden," by Col. J. W. YERBURY and O. THOMAS, *Proceedings of the Zoological Society of London*, June 18, 1895.

- Papio hamadryas*, Aden Baboon.
- Xantharpyia straminea*, Fruit Bat.
- Xantharpyia ægyptiaca*, Fruit Bat.
- Triænops persicus*, Bat.
- Hipposiderus tridens* (*Asellia tridens*), Trident Leaf-nosed Bat.
- Nycteris thebaica*, Bat.
- Scotophilus schlieffeni*, Bat.
- Vesperugo dogalensis*, Bat.
- Coleura afra*, Bat.
- Taphozous perforatus*, Sheath-tailed Bat.
- Rhinopoma microphyllum*, Long Wire-tailed Bat.
- Crocidura russula*, Shrew.
- Crocidura etrusca*, Pigmy Shrew.
- Erinaceus*, sp., Hedgehog.
- Felis maniculata*, Wild Cat.
- Felis caracal*, Caracal.
- Herpestes*, sp., Mongoose.
- Hyæna hyæna*, Striped Hyæna.
- Canis aureus*, Jackal.
- Vulpes nilotica* (now *V. arabica*), Arabian Fox.
- Gerbillus dipodillus pæcilops*, Dipodil.
- Gerbillus dipodillus lixa*, Gerbil.
- Gerbillus hendecapleura famulus*, Gerbil.
- Meriones rex*, Jird.
- Arvicanthis variegatus*.
- Mus* (now *Rattus*) *rattus*, Black Rat.
- Mus gentilis*, House Mouse.
- Acomys dimidiatus*, Spiny Mouse.
- Hystrix leucura*, Porcupine.
- Lepus arabeus*, Arabian Hare.
- Gazella*, sp., Gazelle.

Capra sinaitica, Ibex.

Halicore dugong, Dugong or "Mermaid."

Balenoptera, sp., Rorqual.

R. E. C.

The following paper was first published in the *Annals and Magazine of Natural History* (Ser. 9, Vol. XIV. p. 548, November 1924), by whose courtesy it is here reprinted.

On the Mammals collected in the Desert of Central Arabia by Major R. E. Cheesman between November 1923 and March 1924. By R. E. CHEESMAN and MARTIN A. C. HINTON.

The collection of mammals described in this paper was made by Major R. E. Cheesman in the Hasa Province and in the Jafura and Jabrin Deserts which form part of the Great Southern Desert of Arabia. As might be expected in a district so widely different from the surrounding areas, many forms have proved to be new.

Generally speaking the exceptionally pale desert coloration is the most striking feature of the collection as a whole; and to match it to some degree one has to proceed far to the west, where in the Aïr district of the Central Sahara Captain Angus Buchanan found some little time ago an extraordinarily pale assemblage of mammals. It is of interest perhaps to note that certain inferences as to the special habits of some of the numerous and competitive species of *Meriones* and *Jaculus*, found living together in close local association, derived independently from a study of the skull structure, find confirmation in, and in turn confirm, the observations made in the field to a remarkable degree.

There is reason to suppose that the list given of animals obtained or seen between Hufuf and Jabrin would apply to the whole of the Great South Desert, there being, so far as is known, no physical barrier until the confines of the mountains, such as Aden and Yaman to the south and Muscat to the east, are reached, where markedly darker forms are known to replace the desert fauna. The entire absence of the Mongoose, so plentiful in Iraq, and the replacement of the big dark Iraq Hare by the small pale desert-coloured Hare give definite evidence as to the limits of range of each of the species concerned.

The breeding-time of the few species on which any information was procurable is noteworthy, as in these cases it coincides with the bursting of the desert scrub into new spring growth.

.Arabian Fox (*Vulpes arabica*). Cubs in March.

Al Rimal Desert Jird (*Meriones arimalius*). Young on February 23.

Cheesman's Hare (*Lepus omanensis cheesmani*). Young on February 25.

Pipistrelle Bat (*Pipistrellus kuhli*). Young in May.

TRIDENT LEAF-NOSED BAT

1. *Asellia tridens* Geoff. Arabic "Seha," any Bat; also "Keshaf al Layl."

Hufuf. ♂ 5061, 5077; forearm 50, 51 mm. ♀ 5076; forearm 49 mm.

These specimens were collected in December and are all in the pale fawn pelage; in size they agree with the typical subspecies from Egypt, and for the present, at all events, must be referred to *A. t. tridens*.

A subspecies, *A. t. murraiana*, distinguished by its slightly larger size, has been described from Karachi and Bushire by Anderson. Specimens from Lahej, Southern Arabia, and the Sinai Peninsula have also been referred to this form. In working out the Hufuf specimens we had a series from Baghdad before us. In six males from Baghdad the forearm measurement ranged between 49 and 56 mm., while in two females it was 53 and 55 mm., indicating that, on the ground of larger size, the Baghdad examples should be referred to *A. t. murraiana*.

At Baghdad soon after sunset these Bats can be seen in thousands crossing the Tigris. Flying close to the ground, they leave the city and take to the desert in a continual stream. The same low-flying habit was noticed in Arabia. At Hufuf they did not come out of the town, but seemed to arrive from the calcareous sandstone hills outside. On these hills there was evidence of large colonies in all suitable crevices, though no Bats were actually secured upon the hills themselves. Anderson states that this species is recorded from Senegal, Algeria, Tunisia, Southern Syria, and Zanzibar; while in Egypt it occurs in the Tombs of the Kings and other monuments. In one of the Tombs of Assasif, Egypt, they occur in vast numbers, and on striking a light Anderson was surrounded with a cloud of bats; the sickening stench of this swarm, combined with the oppressive heat of the tomb, quickly drove him out into the open air. This description exactly corresponds with an account

of the Bats in a deep cave in Jabal Qara, near Hufuf, as narrated by Muhammad Effendi, a Revenue official.

The species is remarkable, like some other Leaf-nosed Bats, for possessing a brilliant red (almost vermilion) colour-phase. None so coloured were observed in Arabia or Iraq, but many examples were collected by Admiral Lynes in Darfur in February and May 1920 (*Proceedings of the Zoological Society of London*, 1923, p. 249).

THE HOBGOBLIN BAT

Otonycteris jin. sp. n.

Hufuf. ♂ 5066, 5072, 5073, 5074, 5075.

Distinguished from the other known members of the genus by its larger size, longer and denser fur, pallid colour and more inflated auditory bullæ.

Size large (forearm 64–66 mm.; condylo-incisive length of skull 22.4–23; upper tooth row 8.5–8.8; the corresponding ranges in the other known species are: 58–61; 20.9–22.3; 7.8–8.2).

Fur longer and much denser than in the other species; hairs of back about 10 mm. long. General colour of upper parts near the "pallid purple drab" of Ridgway, lightened by the partly visible white basal portions of the hairs. Under-parts pure white. Membranes and ears very pale.

Skull distinguished from skulls of *Otonycteris hemprichi* and *Otonycteris petersi* by its slightly larger size, heavier build, more inflated auditory bullæ, and larger teeth.

Dimensions of the type measured in the flesh:—Head and body 73 mm.; tail 57; hind-foot 11; ear 40.

Skull measurements:—condylo-incisive length 22.9; zygomatic breadth 15.1; postorbital constriction 4.1; interorbital breadth 7.1; width of braincase 11; width of occiput 11.7; median height of occiput 8; upper tooth row (C–m³) 8.5.

Type.—Adult male, B.M. No. 24.8.2.2. Original No. 5073. Collected at Hufuf town, Hasa, Arabia, on December 10, 1923, and presented to the British Museum by Major R. E. Cheesman. Altitude 200 ft.

Hab.—Hufuf, Hasa, Arabia.

Bats of this genus are extremely rare, and the five now received from Hufuf almost double its representation in the national collection. They were met with only in Hufuf town, and were there very uncommon; the five collected were the only examples

seen, though on numerous occasions special evening excursions were made to observe them.

This Bat has a slow, flopping flight, progressing more slowly than any other. It resembles a large tired butterfly and usually steers a straight course, though on occasions one was seen to turn to catch a fly.

The Hobgoblin Bats were extremely punctual and left the town three-quarters of an hour after sunset, flying towards the palm gardens, and they could be depended on to take the same course night after night. If it was windy, they did not come at all, and one was seen to set forth and return in a few minutes because the wind had suddenly begun to blow.

The ears are carried in life in this shape, but it is not possible to preserve this in the dried skin. The wing-spread measures 420 to 450 mm., while the tail protrudes 7 mm. beyond the filament.



THE IKHWAN PIPISTRELLE

Pipistrellus kuhli ikhwanianus.

Hufuf town. ♂ 5062, 5069; ♀ 5067, 5068, 5078, 5148.

Distinguished among the subspecies of *P. kuhli* and from all other members of the genus, with the exception of *P. coxi* (which is white), by its extremely pale colour.

Essential characters as in the typical subspecies. Size rather small (forearm 33–34 mm.; condylo-incisive length of skull, 12.3).

General colour above, light buff, darkened by the partly visible dark-grey hair-bases. Under-parts white. Membranes pallid. Interfemoral membrane densely clothed with short light buff hair above between the thighs and the base of the tail. Margins of wing membranes whitish as usual.

Dimensions of type measured in the flesh:—Head and body 43 mm.; tail 33; hind-foot 7; ear 10.

Skull:—condylo-incisive length 12.3; zygomatic breadth 8.2; interorbital constriction 3.5; lachrymal breadth 5; breadth of braincase 6.2; mastoid width 7.4; depth of braincase in middle 4.5; upper tooth-row (C–m³) 4–6.

Type.—Adult male, B.M. No. 24.8.2.1. Original No. 5069. Collected at Hufuf town on December 7, 1923, and presented to the British Museum by Major R. E. Cheesman.

Hab.—Hufuf, Hasa, Central Arabia.

Among the material used for comparison were two specimens obtained at Bahrain and three from Fao, which form part of the Cox-Cheesman collection and are referable to *Pipistrellus kuhli*. The Hufuf Pipistrelles are, however, very conspicuously paler, both as regards their fur and their membranes, than any other form of *P. kuhli*.

This is a common Bat in Hufuf town, and most small Bats seen are of this subspecies. They are very active and difficult to secure. Several lodged behind the date-log ceiling of the veranda of a house and they seemed to live in pairs. Half an hour after sunset they would come out singly; and two or three hours later the one which had remained at home would begin to chirrup, a noise which foretold the return of the wanderer. Specimens of *P. kuhli* collected at Fao had two young at breast in May.

HEDGEHOG

? *Paraechinus dorsalis*. Arabic "Qunfud." Badawin "Daalij."

South Hasa :—imperfect skin of a Hedgehog, eaten by a Fox. Judging from what is left of this specimen the skin belonged to a species of *Paraechinus*, probably related to *P. dorsalis* of the Hadhramaut.

Major Cheesman saw the tracks of a Hedgehog in the bushy sand-dunes of the Jafura Desert, but did not find a live specimen.

WILD CAT

Felis sp.

A Wild Cat was mentioned by the Al Murra tribesmen as being seen by them in their wanderings towards the centre of the Great South Desert—Al Rimal. This would prove a very interesting animal if specimens could be obtained. It was said to be larger than the domestic cat, with a much shorter tail.

STRIPED HYÆNA

Hyæna hyæna Linn. Arabic "Dhaba."

Footmarks of Hyænas, probably of this species, were seen as far south as Jabrin, where they were apparently plentiful, although no specimen was obtained. What they can find to live upon when the tribes move away with their camels is a mystery.

The range of this species extends from North Africa through Palestine, Persia, Trans-Caspia, and India.

FOX

Vulpes arabica. Arabic "Husaini." Classical "Thalib."

No specimens.

Several Foxes were seen in the chalky sandstone hills Jabal Abu Ghanima, three miles northward of Hufuf.

They resembled in size and appearance the small Desert Foxes in Iraq (*Vulpes persica*), and in one seen at close quarters the black breast was conspicuous.

A live cub was brought from Kuwait by Mrs. F. Holmes and was presented to the London Zoological Gardens. The vixen had been killed by Arabs just outside Kuwait, and the three small cubs were brought into the town in March, 1924. The first coat was a uniform pale sandy colour, and with its large ears the animal looked more like a Fennec Fox, but at the first moult, at the age of a little over six months, the black chest, black behind the ear, and white tip to the tail developed, all typical characters of the larger or *leucopus* group of Foxes to which *Vulpes persica* belongs.

INDIAN WOLF

Canis pallipes Sykes. Arabic "Dhib."

Not uncommon at Hufuf and Jabrin, but only footmarks were seen.

A specimen from the Cox-Cheesman collection is now alive in the London Zoological Gardens. Its coat is remarkable for its pale grey coloration. It was obtained by La Personne in the Persian Gulf as a cub.

THE JACKAL

Canis aureus Linn. Arabic "Wow-wi."

Hufuf. 1 ♀. Ear measurement 76.

Plentiful in the gardens of the Hufuf oasis, but not seen outside, or at Jabrin. They have bright-coloured coats, and the hair is long.

THE RATEL

Mellivora sp. Arabic "Dhribān."

Only one Ratel was seen. It was surprised at close quarters, in the trough of sand-dunes in Jafura Desert. It was a darker

grey on the back than the specimens seen in Iraq, but this seems to vary with age, the youngest being the lightest.

MERIONES, or JIRDS (rat-like desert rodents)

This genus is represented by four very distinct forms, distinguished from each other by characters of skull and pelage, which appear to be closely correlated in each case with special habits and the peculiar environment. Thomas¹ has already shown that "a single district may contain two or three species, all looking so alike as to be readily confused with each other, and yet really distinguishable on close examination"; and that the differences in the structure and development of the auditory bullæ afford the primary means of distinction and enable us to separate the species into four groups. The present collection confirms these views of Thomas; while the field observations suggest an explanation.

The first species, described below as *M. ismahelis*, is a member of Thomas's *a* group, closely related to *M. crassus*, of Sinai. In it the bullæ are enormously developed, the coat very dense and long, and the colour very pale. It is confined to the sand-dune desert and is a strictly nocturnal animal. In this it agrees with *M. crassus*; for Hedenborg, who collected the original specimen of the latter species in Sinai, described it as "Nocturnus, prædatur ante lucem."² The extravagantly developed bullæ appear to indicate, therefore, that in the darkness the animal has to rely chiefly upon its sense of hearing for protection from its enemies; while its unusually heavy coat is no doubt to be correlated with the low night temperature of the desert.

M. arimalius, the second species described below, is also related to the members of the *a* group, its closest affinities being apparently with *M. pelerinus*, described from N.W. Arabia. This species inhabits the true desert; it is a diurnal rodent, scampering about on the hot sand outside its burrows and feeding at all times except during the hottest hours about noon. In it the bullæ are considerably less developed, suggesting that both sight and hearing are relied upon for defence. The coat is very thin and short, sufficient to protect its wearer from the sun, but not developed as a special defence against the night cold. The exceptionally pallid colour would seem also to be directly correlated with the diurnal habits.

¹ Thomas, *Ann. & Mag. Nat. Hist.*, Ser. 9, Vol. III., 1919, p. 263.

² Sundevall, *Kongl. Vetenskaps-Acad. Handl.*, 1842, p. 233.

• The remaining two forms treated as subspecies of *M. syrius* are much less specialised. They are not inhabitants of the true desert, but are found along the borders of the cultivated fields at Hufuf, where lucerne is grown; and upon this plant they feed. At Hufuf there are two rivulets, one fed by the Khorasan spring, the other by the Khadud spring; and it is upon the banks of these rivulets that the lucerne is grown. Between the streams there is a bare chalky sandstone plateau about a mile wide, untenanted and uninhabitable by this *Meriones*. It is of interest to find that each rivulet has its own peculiar form of *M. syrius*, the sandstone plateau between being apparently an impassable barrier. One of the forms, *M. s. edithæ*, has the richer colouring of true *syrius* combined with a much stronger skull and an unusually robust body; the other, *M. s. evelynæ*, has the skull and body proportions of *syrius* combined with a pallid dorsal coloration.

NOCTURNAL DESERT JIRD

Meriones ismahelis sp. n. Arabic "Jerai mal burr"; includes most desert rodents except Jerboas.

Hufuf oasis. ♂ 5120, 5121; ♀ 5103, 5104, 5116.

Jabrin oasis. ♂ 5174.

A very pallid member of the *crassus* group, distinguished from *M. crassus* by its smaller size, finer coat, and paler colour.

Size medium (hind-foot about 31 mm.; condylo-basal length of skull up to 36 in adult ♂). Tail as in the other members of the group, short, about equal to head and body measurement.

Fur very fine, dense, and long; hairs on rump about 20 mm. in length. Colour of upper-parts near "light buff" of Ridgway; under-parts, together with the hands and feet, pure white. Upper surface of tail light buff like the back, not "cinnamon buff" as in most other species of *Meriones*. Naked portions of soles light flesh colour, instead of being black as in the *syrius* group.

Skull similar to that of *M. crassus* in general form, but slightly smaller. Auditory bullæ very large, with the mastoid, supratympanic, and premeatal portions greatly inflated as in the related species.

Dimensions of type measured in the flesh:—Head and body 124 mm.; tail 124; hind-foot (without claws) 31; ear 17.

Type.—Adult male, B.M. No. 24.8.24. Original No. 5121. Collected at Hufuf oasis on January 7, 1924, and presented to the British Museum by Major R. E. Cheesman.

The nearest relation of this species is undoubtedly *M. crassus*, a species described from Sinai by Sundevall in 1841, characterised by similar length and highly developed auditory bullæ and strictly nocturnal habits.

At Hufuf *M. ismahelis* was sharply contrasted by these habits with the other Jirds, which all feed by day.

The distribution of the members of the *crassus* group is also interesting. They follow the line of true sand-dune desert which connects the great desert areas of Africa with those of Arabia, proceeding from the Sudan to Sinai, thence marching south to the Nafud, to the Dahana and, by yet another name, to Al Rimal (marked on maps as the Ruba-al-Khali) in unbroken continuity. *M. pallidus*, Bonhote, is the African representative of the group and it was described from specimens collected in the Sudan. *M. crassus* is found throughout the desert of Sinai; while *M. ismahelis* extends in Arabia as far southwards as Jabrin.

Although in adult pelage this new species is extremely pale, young specimens are darker and redder, with coats resembling those of *M. pelerinus*, a diurnal species described by Thomas from Tebuk in N.W. Arabia. The coat of *M. ismahelis* is thicker and longer and has a peculiar "broken" or "shingled hair" appearance, very different from the sleekness characteristic of the other species in the neighbourhood of Hufuf.

This species was never found in gardens. Its burrows were made in sand or soft ground in the sandstone plains outside the cultivated area. Each burrow had three or four entrances, which were let down in the horizontal ground, in contrast to those of the *syrius* group, which seem to prefer a perpendicular mud wall or bank.

Major Cheesman never caught more than one at each earth, which suggests that they are solitary. They never appeared until the last glimmer of daylight had gone, say about two hours after nightfall; and they retired to their burrows again before the dawn.

AL RIMAL DESERT JIRD

Meriones arimalius sp. n.

Jabrin. ♂ 5194; ♀ 5195.

Jabal Aqula, Jabrin. ♂ 5205; ♀ 5201, 5206, and two in spirit.

Most like *M. pelerinus* from N.W. Arabia in skull, but outwardly distinguished by its pallid colour, short thin fur and much longer white-tufted tail.

Size large (hind-foot 37 mm.; median length of skull 38.3), the hind-foot and tail much longer than, instead of being about equal to, the length of head and body.

Fur short, and closely adpressed; hair on rump about 10 mm. in length. General colour paler than in any other known member of the genus. Crown of head and centre of back near "cream-buff" of Ridgway, fading on cheeks and flanks to "ivory-yellow." Under-parts, together with the haunches and feet, pure white; the hairs of the ventral surface white. Tail, including its tuft, "ivory-yellow" throughout, with a few scarcely perceptible grey hairs in the tuft.

Skull like that of *M. pelerinus*, but with the auditory bullæ somewhat less developed. In each bulla the mastoid portion is less swollen and terminates posteriorly but little behind the occipital plane; supra-tympanic and premeatal swellings a little less marked.

Dimensions of type measured in the flesh:—Head and body 132 mm.; tail 163; hind-foot 37; ear 18.

Type.—Adult male, B.M. No. 24.8.2.5. Original No. 5194. Collected at Jabrin on February 22, 1924, and presented to the British Museum by Major R. E. Cheesman.

This interesting species, the palest by many shades of all known Jirds, is essentially an inhabitant of the sand-dunes of the Great South Desert of Arabia, and it was not found north of Jabrin. Its long, pale, cream-coloured tail, lacking all trace of the cinnamon tint and black fringe so generally found in *Meriones*, sharply distinguishes it from all related species. This Jird feeds exclusively on the bush *Arthrocnemum fruticosum*, called "Gadha" by the Arabs, and its earths were only found on the gadha-covered dunes of soft white sand. It is a diurnal species, feeding throughout the day with the exception of the hottest hours about noon; and the smaller development of the auditory bullæ, as compared with those of *M. pelerinus*, is no doubt correlated with the daylight activities of the animal.

They are shy, and any movement causes a stampede. They then sit inside the holes, and as long as there is a suspicion of danger they make a warning note resembling a ticking sound, as if a man were marking the seconds by knocking two sticks together. While the noise continues no Jird will show itself.

One immature specimen just able to run was caught on February 23, but was spoilt by the trap.

THE KHADUD JIRD.

Meriones syrius edithæ subsp. n.

Khadud Springs, Hufuf. ♂ 5129, 5132; ♀ 5131.

A powerfully built subspecies, distinguished from the typical form by its longer and redder tail and heavier skull.

Fur sleek and moderately long; hair over rump about 14 mm. in length. Colour of upper-parts warmer and richer than in *M. s. evelynæ*, near the "pinkish cinnamon" of Ridgway upon the crown of the head and back. Under-parts pure white, the bases of the white hairs grey. Hands and feet white, washed with cream-buff above; naked parts of soles black. Tail "ochraceous salmon," with terminal pencil of long black hairs.

Skull more massively built than in typical *syrius*, with stronger supraorbital beads, and longer palatal foramina. Dorsal edge of masseteric plate thrown somewhat further forward. Bullæ slightly more inflated.

Dimensions of type measured in the flesh:—Head and body 143 mm.; tail 181; hind-foot 37; ear 18.

Type.—Adult male, B.M. No. 24·8·26. Original No. 5129. Collected by Major R. E. Cheesman at Khadud Spring, Hufuf, January 10, 1924.

Hab.—As above.

This subspecies has been named in honour of Miss Edith Cheesman.

It is surprising to find that the Jird living in gardens watered by the Khadud spring, Hufuf, is of a redder colour and stronger and bigger subspecies than those found in the gardens watered by a separate though neighbouring spring, the Khorasan. As the differences are evident in the examination of the series of skin and skulls, it has been decided that they are sufficient for separation subspecifically from *syrius* and each other.

The springs are not mere wells, but are flowing streams watering considerable areas.

The gardens and crops are similar, but are divided by a mile of chalky sandstone plain which seems to constitute an impassable barrier. Both subspecies live an artificial life in holes at the base of mud walls surrounding the lucerne fields, and feed on the young leaves and shoots. They do a lot of damage when they are numerous, and a strip of the crop along the walls is bitten short in much the same way as when rabbits attack part of a field of corn in England. They are pugnacious, and contests are frequent in which biting each others' long tails plays a conspicuous part; consequently few tails are unmutilated

and some are stumps. They feed by day and throughout the day, and have the smaller bullæ associated with this habit. The tail is carried straight and rather high. Jirds were not seen to carry the tail over the back nor to use it to support the animal as a prop, as in some illustrations.

THE KHORASAN JIRD

Meriones syrius evelynæ subsp. n.

Khorasan Springs, Hufuf. ♂ 5047, 5050, 5053, 5059; ♀ 5051, 5052.

An exceptionally pallid subspecies, with the tail much less rufous than usual.

Fur sleek. General colour of upper-parts pale ochraceous buff; under-parts pure white, the bases of the white hairs grey. Hands and feet white, inconspicuously blotched with pale ochraceous buff above; naked parts of soles black. Tail pale ochraceous buff above and below down to the commencement of the black dorsal fringe and terminal pencil.

Skull smaller than that of *M. s. syrius*, but essentially similar in general form and structure. Auditory bullæ relatively larger and more globosely inflated.

Dimensions of type measured in the flesh:—Head and body 144 mm.; tail 156; hind-foot 34; ear 18.

Type.—Adult male, B.M. No. 24.8.27. Original No. 5050. Collected at Khorasan Spring, Hufuf, Hasa, Arabia, on November 28, 1923, and presented to the British Museum by Major R. E. Cheesman.

This subspecies has been named in honour of Miss Evelyn Cheesman.

M. syrius evelynæ feeds in the daytime and seems to enjoy the sunshine, and skulls show the lesser developed bullæ of the diurnal Jirds. It is distinguished from *M. syrius syrius* by its paler colour and whiter feet, and from *M. s. edithæ* by its much paler colour and particularly by less cinnamon buff in the tail.

THE GERBIL

Gerbillus arduus sp. n.

Jabal Dharabin, Jafura Desert. ♂ 5162, 5214.

Zarnuqa, S. Hasa. ♂ 5221.

Most nearly related to *G. cheesmani* of Iraq, but with relatively longer hind-foot, slightly paler colour and whiter tail.

General colour of upper parts dull sandy buff, lacking the

warmer ochraceous tint seen in *G. cheesmani*. Under-parts together with hands and feet pure white. Tail with its upper surface very faintly suffused with cream buff in its basal two-thirds; elsewhere white.

Skull and teeth essentially as in *cheesmani*, but the mesopterygoid fossæ shorter and broader and the auditory bullæ (particularly their mastoid portions) a little more inflated.

Dimensions of type measured in the flesh:—Head and body 86 mm.; tail 124; hind-foot 29; ear 12.

Skull:—greatest median length 28.5 mm.; greatest diagonal length 29.2; condylo-incisive length 24.8; zygomatic breadth 15; interorbital breadth 5.3; breadth of braincase 13.5; bi-meatal breadth 15.3; nasals 10.4; palatal foramina 4.1; bullæ, longest diagonal 12.1; breadth of a bulla at right angles to last, exclusive of meatal projection, 5.9; upper molars 3.5 (on crowns), 3.8 (alveoli).

Type.—Adult male, B.M. No. 24.8.2.3. Original No. 5162. Collected at Jabal Dharabin, Jafura, on February 14, 1924, and presented to the British Museum by Major R. E. Cheesman. Altitude 200 feet.

Hab.—Jafura Desert, Central Arabia.

This beautiful little animal is strictly nocturnal. Closely related to *G. cheesmani* described from Iraq, it may later be shown to intergrade with the latter to the north-east, but its differences, the result of a more intense specialisation for life in the desert, entitle it to be treated, for the present at all events, as a distinct species.

Every morning in camp when on the march in dune country some little round footmarks, no bigger than a small pea, were noticed in the sand, and it was some time before our visitors were discovered to be this beautiful little Gerbil. Afterwards it was noticed that temporary holes were always dug by them near the camp, doubtless in order to allow the inhabitants to be on the spot the following night. We eventually caught one in a trap baited with date. They are delicate little nocturnal creatures the size of dormice, with palest shades of desert colouring and large black eyes like boot-buttons.

THE DIPODIL OR NAKED-SOLED GERBIL

Dipodillus dasyurus Wagner.

Dalaiqiya, Hasa. ♀ 5228.

Only one specimen with skull broken by trap; it is not possible to carry identification further.

Trouessart gives the distribution of *D. dasyurus* as Arabia, Red Sea, and Oman.

This specimen was caught in bushy desert, near a small garden and well. The badawin who brought the trap in did not distinguish it from a House Mouse.

THE BLACK RAT

Rattus rattus Linn. Arabic "Jeraydi."

Hufuf Gardens. ♂ 5126, 5127.

These have brown backs and white bellies and represent the wild original form of the Black Rat.

Major Cheesman did not see one in the town. At Hufuf it was a garden animal living in burrows near the running streams and making stick and leaf nests in the trees.

HOUSE MOUSE

Mus musculus gentilis Brants. Arabic "Fars."

Hufuf Gardens. ♀ 5125.

Not very plentiful and more often seen in the gardens than in the town.

BUXTON'S MOLE RAT

Nesokia buxtoni Thos.

Oqair, Hasa. ♂ 5012.

The colour of the Oqair specimen matches that of the type of *buxtoni* described from Iraq, but the skull is smaller. However, it matches a skull of a male *buxtoni* from Qurna, and there is no doubt that it is the same animal.

The interest of the specimen centres round its appearance at Oqair, where the sand desert comes down to the coast. There is a small patch of rushes a few hundred yards long, and thirty wide, near the sea, but just above high-water mark. In this the little colony of *nesokia* ekes out an existence. Probably the next colony is in Hufuf, removed from them by forty miles of bare sandhills. Their mounds were seen in the Hufuf gardens, but no specimens were obtained there.

ARABIAN JERBOA

Faculus florentiae sp. n. Arabic "Jarbu."

Jabal Aquila, Jabrin. ♂ 5207.

Jafura Desert. ♀ 5123.

Distinguished from all its geographical allies by its large size, long tail and paler colour.

Size large (hind-foot 55–60 mm.), nearly as in *J. syrius*.

General colour very pale. Top of head and back near "pale pinkish-buff" of Ridgway. On the rump some of the hairs have dark tips, which form peculiar shade markings in the general pattern and are continued over the flanks to the white sides. Under-parts together with hands and feet pure white. Toes heavily booted with long stiff white hairs as usual. Tail pale pinkish-buff above, white below up to the tuft, which is long and white; there is a small patch of "vinaceous slate" where the buff and white meet.

Skull and teeth nearly as in *J. syrius*.

Dimensions of the type measured in the flesh:—Head and body 114 mm.; tail 176; hind-foot 55; ear 22.

Skull:—greatest median length 31.9 mm.; greatest diagonal length to back of auditory bullæ 34.5; greatest breadth across face 21.8; interorbital breadth 11; bi-meatal breadth 22.6; infraorbital foramen, height 6.7; breadth across the two foramina 15; upper molar series (crowns) 4.9.

Type.—Adult female, B.M. No. 24.8.2.8. Original No. 5207. Collected at Jabal Aqula, Jabrin, on February 24, 1924, and presented to the British Museum by Major R. E. Cheesman.

Hab.—Jabrin, Al Rimal, and Jafura Deserts, Central Arabia. Altitude 200 to 400 feet.

This Jerboa is named in honour of Mrs. F. M. Cheesman.

The Jerboa of the Jabrin Desert is distinguished as being the palest known member of the genus, more pallid even than *J. airensis*, the form inhabiting the district of Aïr in the Western Sahara. *J. loftusi*, described from Mohammerah, Persia, and its subspecies, *J. c. vocator*, described from Seeb, twenty-two miles N.W. of Muscat, are smaller and darker; while *J. j. syrius*, described from Karyatein, in the Syrian Desert, has a coat which contains brown and greys almost too dark to permit them to be described as having a desert coloration.

The study of this Arabian material leads us to think that *syrius* and *vocator*, described by Thomas as subspecies of *J. jaculus* and *J. loftusi* respectively, will eventually have to be treated as full species.

In the north-east of Arabia *J. florentiae* reaches the coast of Kuwait, thus interrupting the range of *J. loftusi*. This coastal representative is slightly darker than the typical form of the

central deserts and it may therefore be described as a subspecies as follows :

Faculus florentiae oralis, subsp. n.

Essential characters and size as in *F. florentiae*. Colour noticeably darker, though conspicuously lighter than in either of the former subspecies of *loftusi*.

Dimensions of type measured in the flesh :—Head and body 120 mm.; tail 197; hind-foot 56; ear 24.

No skull.

Type.—Adult male, B.M. No. 7.11.22.27. Original No. 8.K.6. Collected at Kuwait, April 22, 1907, and presented to the British Museum by Major S. Knox.

Hab.—Coastal region of N.E. Arabia.

A specimen in the Cox-Cheesman collection (No. 1612), from Zobair matches the two examples collected by Major Knox at Kuwait very exactly.

Jerboas dig a straight hole with one entrance which is stopped up from inside with sand or gravel. The end of the tunnel is brought up near the surface, some thirty yards away, but is not opened. When a fox commences to dig at the entrance the Jerboa opens out the hole at the far end and darts off unobserved or with a useful start. The badawin catch them by finding the tunnel near the back exit with their toes, and two men then dig at each end till they meet. The Jerboa has one more ruse. He opens out a short branch tunnel, and unless the man knows this he digs past him. Once a Jerboa is released he is too fast for a man and turns too cleverly for a dog to take him.

CHEESMAN'S HARE

Lepus omanensis cheesmani Thos. Arabic "Arneb."

Jabal Aquila, Jabrin. ♂ 5169, 5204.

Jafura Desert. ♀ 5163.

The first Hare of this species was obtained near Salwa, in Hasa, 1921, and the Jabrin Hares match it well in colour and size.

They are remarkable in the field for their small size, very long ears, and pale desert colouring.

Lepus omanensis from Muscat resembles it in size, but it is darker, and brown, in fact nearer the English rabbit in colour. *L. o. cheesmani* is therefore the desert form and is the creation of the true sand desert.

Apart from its darker colour, *Lepus connori*—the Hare of Iraq—is a much larger animal, as is shown by the following measurements :

Hind-foot of *L. connori* 120 mm., from Sharoban, Iraq.

Hind-foot of *L. arabis* 100 mm., from Sanaa (San'a), Yaman.

Hind-foot of *L. o. cheesmani* 79 mm., from Jafura Desert.

Skull measurements :—length from back of skull to outside edge of teeth :

L. connori 93 mm., from Iraq.

L. arabis 80 mm., from Hiswa, east of Aden.

L. o. cheesmani 71 mm., type Salwa.

Lepus arabis is also one of the darker Hares.

L. o. cheesmani is fairly plentiful from Hasa to Jabrin in the vast gravel plain and sand-dune deserts, wherever a patch of scrub provides food and scanty cover. There are few places where they can hide, so they are dependent on their colour, which resembles the sand, to protect them from their foes. Apparently as long as the animal keeps still it is invisible as far as natural enemies are concerned. A female taken in Jafura, February 25, had two young with her.

They dig earths but only seem to make use of them when hard pressed.

THE GAZELLE

Gazella sp. Badawin " Dhabi."

No specimen.

The tracks of a Gazelle were seen in sand-dunes on the Jafura Desert.

The country between Hufuf and Jabrin had been without a drop of rain for nearly two years, and there was no grazing, which had driven the Gazelle to other districts. The badawin say that when the bushes are growing Gazelles are plentiful in Jabrin.

Two species have been named from near by, viz. :

Gazella muscatensis—type locality, Muscat ; and

Gazella marica—type locality, Najd, Central Arabia, with range given by Lydekker as desert tract from Najd to Western Oman.

Gazella morica is the pale desert form of *G. muscatensis*, which it resembles in size. Both are smaller than *G. arabica* from Aden.

ARABIAN ORYX

Oryx beatrix Gray. Arabic "Wudhaihi."

No specimen.

The type was presented to the British Museum by Captain Sheppard in 1857, who was supposed to have obtained it from the shores of the Persian Gulf. The material in the national collection is scanty, and the donors probably obtained the skins from natives who were not the actual collectors, so localities are not very reliable.

The home of this fast-diminishing species is to-day the uninhabited centre of the Great Arabian Desert, to which they have been driven by the increasing arms among the tribes. The Al Murra tribesmen, who roam as near the centre as any Arabs, say they were plentiful many years ago in the deserts around Jabrin in seasons of good rain, when they followed the growing vegetation. Now they are only to be found far to the south in the Great Desert, more particularly in the neighbourhood of Najran.

A fine specimen sent during the war to H.M. the King by the Sultan of Najd is still alive in the London Zoological Gardens. Najd in this case should not be given as the place of origin, as animals are sent for long distances to the ruling sovereign by the tribes, as presents, and it would be safe to assume that this and all those in the British Museum have had their origin in the South Desert, with the exception of those killed by D. Carruthers in Tebuk in the Northern Nafud.

The Arabian species is the smallest of the *Oryx* group. Lydekker gives shoulder height 35 inches, and horns from 22 to 27½ inches in length.

APPENDIX II

BIRDS

(From *The Ibis* for January 1925, pp. 7-31, with the author's grateful acknowledgments.)

The Birds of Jabrin, Jafura, and Hasa in Central and Eastern Arabia and of Bahrain Island, Persian Gulf. By Dr. C. B. TICEHURST, M.A., M.B.O.U., and Major R. E. CHEESMAN, O.B.E., M.B.O.U.

Corvus corax ruficollis Less. "Ghorab."

The Brown-necked Raven was seen at intervals throughout the country traversed, nearly always in pairs, but on one occasion three and on another four were noticed. Each breeding pair seems to have a beat of twenty miles round its nesting-site or a reservation forty miles across, but at isolated large camps, as at Jabrin oasis, they congregate slightly of necessity for food. A nest with six eggs was found on February 13 in the Jafura desert, situated in a thornless, leafless bush, *Calligonum comosum*, "Aabel," only eight feet high in the trough of high sand-dunes. The parent was put off the nest, but just kept out of shot. Of the eggs, five were normal and the sixth small and olive-brown in colour, measuring 32×23.5 mm.; the others varied from 43 to 50×30 to 31 mm. The inaccessibility and deserted nature of the country are emphasised by the lack of the usual precautions taken by this bird in its choice of nesting-site. Another nest was seen on February 16 at Jabal Aquila, at the top of an acacia, *Acacia flava*, "Salam," twenty feet high. There were probably eggs in the nest, as the bird was put off, but the thorns were too formidable for the Arabs to face a climb. A deserted and empty nest was found on a cliff-ledge at Jabal Zarnuqa.

On several evenings at Hufuf a pair came to roost on tussocks of grass in the desert; probably an acquired habit, as the position is safer than the date-trees of the oasis, where they would be at the mercy of the local sportsmen.

It was surprising to find this the only representative of the

Crow tribe in Hasa, as the date-gardens of Hufuf appeared suitable for the Hooded Crow. The croak is similar to but not so loud as the Common Raven's. It is difficult to see in the field any brown tinge on the neck, and identification would not be easy at a distance in localities where *laurencei* might occur. In the *Geographical Journal* (Nov. 1923) I recorded this Raven as *C. c. laurencii* in error.

(R. E. C.)

Sturnus vulgaris Linn.

Apparently only stragglers reach Hasa in winter, and the Starling cannot be looked on as a regular winter visitor; those that venture as far do not remain and, maybe, return whence they came, to Persia or Iraq. The following are the only records:—three seen at Oqair on November 19 and one there on March 7. Two flocks of about fifty birds passed over Hufuf town on December 8 at dawn, flying south; they were not seen again.

Passer domesticus hufufæ. "Usfür."

C. B. Ticehurst & Cheesman, *Bull. B.O.C.* xlv. 1924, p. 19.

Common and resident at Hufuf, but none seen at Oqair or Jabrin. House-Sparrows, probably the same race, were common on Bahrain. The grey rump and the absence of much marking on the mantle were noticeable characters in the field.

Nine males and five females were obtained at Hufuf, and have recently been described as a new race. They belong to the white-cheeked, small-billed group, and are nearest *indicus*; from the latter they are distinguished by the general paler coloration, the head, rump, and upper tail-coverts in fresh plumage are greyer, very slightly washed with a paler brown and to a less extent than in *indicus*, under-parts purer white, and the mantle has less of the cinnamon markings.

♂. Wing 72–77; bill (base) 13.25–14.5 mm.

♀. Wing 70.5–74; bill (base) 12.5–13.5 mm.

Old males have black bills even in winter. *P. d. burvi* from Southern Arabia (Aden, etc.) seems to be quite indistinguishable from *indicus*. The Hufuf Sparrow evidently has been isolated in the oasis long enough to have become a recognisable race, as might have been expected.

Emberiza calandra Linn.

One Corn-Bunting seen at Oqair in a lucerne patch by a well on November 17 was probably a straggler; it breeds in Iraq.

Alæmon alaudipes cinerea (Zar.). "Umm-al-Salim."

This Lark is resident and generally distributed : if not "common" in the usual sense of the word, it more nearly deserved that title in this wilderness than any other species; indeed, for many miles' march it would be the only bird seen. It would seem to be one of those species which have solved the problem of life without drinking, for it was met with as much as seventy miles away from the nearest well, though it is possible that occasional morning mists and dew observed in the sand-dunes would enable it to take drops of moisture from the bushes; however, it must be able to exist for long periods without drinking, and it was never seen at wells or water-holes, a fact which one of us noted also in the Sind desert.

Four males: wing 132-140; bill (base) 32.5-36.5, from frontal feathers 28-31 mm.

Three females: wing 116-124.5; bill (base) 31-32, from frontal feathers 26-27.5 mm.

These are a trifle longer in bill than Sind birds, but otherwise they match them pretty well; however, bill-length in this species varies very much. They are on the whole greyer than Egyptian birds and considerably larger, though in colour alone single birds can be matched with single birds from Egypt. As I have pointed out before, colour in these Larks is a character which must be used with great caution.

Ammomanes deserti azizi. "Hamra."

C. B. Ticehurst & Cheesman, *Bull. B.O.C.* xlv. 1924, p. 20.

This Desert Lark, which is certain to be resident, was found usually in the debris at the foot of chalky sandstone hills in pairs or small parties, and often associated with *Ammomanes c. pallida*. Cheesman first obtained this Lark at Abu Mahara near Salwa on March 31, 1921—a male about to breed. On his recent trip he found it at Jabal Abu Ghanima (500 feet), near Hufuf, and on Jabal Zarnuqa, while small parties were seen in the waterless marches to Jabrin, but these were probably wanderers from their normal terrain, as usually they were not met with except within reach of water-holes; in fact, the surest way of finding *Ammomanes* is to watch by an isolated well within reach of the foot-hills, as we both previously had noted in the Pusht-i-kuh and Sind. The sandstone rubble debris which these birds particularly affect has a pinkish-white tint exactly resembling the coloration of the birds. The varied colorations

in *Ammomanes* appear to be closely correlated with the colour of the ground they live on, and have nothing to do with the amount of rainfall.

This race is named in honour of Major Cheesman's host—His Highness Abdul Aziz ibn Saud, Sultan of Najd.

Three males, wing 100–105; five females, wing 94–100 mm. Bill as in *isabellina*.

Much paler above than *isabellina*, which is the nearest to it; pale pinkish isabelline above, when worn, creamy-isabelline; below much whiter and the ticking on the throat very dark. Bill lemon-yellow.

An *Ammomanes* of sorts was seen on Bahrain Island.

Ammomanes cinctura pallida Cabanis. "Hamra" (? any brown bird).

What has been said about the last applies pretty well also to this little Desert Lark, as both are often found together. The smaller size of this bird is not very noticeable in the field. It is doubtless resident, and was seen as far south as Jabrin.

Four males, wing 93–97 mm. Bill dark horn above, paler below.

In a series these birds are greyer on the upper parts, tertials and secondaries, less sandy-red than in *arenicolor*, and have whiter breasts and flanks less tinged with pale sandy-isabelline; some individual birds cannot, however, be picked out. *A. c. pallida* was described from Qunfuda on the Red Sea (Asir Prov.), and Dr. Stresemann, to whom the Hasa birds were sent, has compared them with the type in the Berlin Museum and he finds them "quite alike."

It appears to me that this small isabelline Desert Lark is clearly a race of *cinctura* and not of the large dark "agricultural" *phœnicura*, whose more western and more desert representative perhaps is *zarudnyi*. (C. B. T.)

Alauda arvensis intermedia Swinh.

The Skylark is a winter visitor in quite small numbers. A single bird was obtained seven miles north of Hufuf, feeding with Short-toed Larks on rice-threshing floors; a few were seen at Hufuf on December 22 and January 6 in growing wheat.

Galerida cristata magna Hume. Arabic "Gobar."

The Crested Lark is by no means a common bird in Hasa; six were seen at Oqair on November 17, and in the forty-mile

march to Hufuf only one pair, and that at a halting-place where there is a well. At Hufuf one pair and a flock of eight were all that were seen during the whole winter; at Jabrin (February 19-22) one or two were always round the camp; in long waterless marches it was not met with at all. From the scarcity of this bird at a large oasis like Hufuf one must suppose that it is a winter visitor, as it seems very unlikely that the total Crested Lark population would be five pairs! It is known to be a winter visitor to Lower Sind.

Six males: wing 109.5-113; bill (base) 20-22, from frontal feathers 17-18.5 mm.

This series match birds from Quetta very well; *G. c. magna* varies a little in colour, some being greyer, some sandier than others.

These Hasa birds are easily distinguishable from *tardinata*, which has a browner mantle with darker centres to the feathers, less white under-parts, and is smaller.

Five males, S. Arabia: wing 102-106.5; bill (base) 19.5-20.5 mm.

Five females, „ wing 96.5-98.5; bill (base) 17.5-20 mm.

On Bahrain Island Crested Larks were common in March, but unfortunately no specimens were obtained.

Calandrella rufescens minor (Cabanis).

Large flocks of Short-toed Larks were met with in the vicinity of Hufuf wherever there were rice-threshing floors, and they came regularly to drink at pools of spill-water from irrigation. A flock was met with in the waterless desert between Hufuf and Jabrin, but these birds were apparently only passing through or touring.

Two males: wing 92-94; bill (base) 11 mm.

Two females: wing 90.5-92; bill 11 mm.

These four birds are so near *minor* that I certainly should not separate them, though they seem a trifle paler perhaps on the upper parts; they are certainly neither *seebohmi* nor *heinei*. They are probably winter visitors.

Calandrella rufescens persica (Sharpe).

Mixed with the last-named in the same flocks and feeding on the rice were numbers of this larger race, which must, I think, be *persica*, though I have seen no specimens in exactly the same dress. (C. B. T.)

One of the most plentiful birds in Hasa oasis, it was met with at Oqair on November 18 and at Jabrin on February 23; probably a winter visitor.

Three males: wing 99-106; bill (base) 12.5-13 mm.

Three females: wing 94-97; bill (base) 12-13.5 mm.

Bill lemon, legs horn-brown.

Motacilla alba dukhunensis Sykes.

The White Wagtail is a winter visitor to the Hasa oasis, and is plentiful everywhere in flocks in lucerne fields and growing wheat. Every evening they flighted in flocks over Hasa town to roost on the plains to the north. Not seen at Jabrin. Plentiful at Oqair on March 6 and several there on the 29th, while at the Salwa wells several, doubtless halting migrants, were seen on April 5. A starved bird was caught at sea off Jabal Hawaith, Salwa, on April 1, 1921.

Motacilla cinerea Tunstall.

A single Grey Wagtail wintered in Hufuf oasis, and was seen feeding about the same spring on many occasions from December 4 onwards. One at Oqair, probably on passage, on March 29, 1921.

Motacilla flava Linn.

Motacilla feldegg Michah.

Yellow Wagtails are passage migrants through Hasa. A Hufuf garden-owner informed Cheesman that "Hufuf is invaded by little bright yellow birds that live in the skies and descend at certain seasons to the lucerne fields!" The fore-runners of this invasion were seen on March 7 in two male *M. feldegg* in a lucerne field at Oqair. The spring arrival of Yellow Wagtails in the East is a remarkable sight which we have witnessed in Iraq and Sind—lucerne fields which held not a bird one day may be yellow with males, and males only, the next morning. The earliest date in Iraq is March 13. Blue-headed Wagtails were met with on passage at Salwa at the end of March 1921, and at Oqair on September 26, 1920.

Anthus pratensis (Linn.).

A Meadow-Pipit was seen at Oqair on November 11.

Anthus cervinus (Pall.).

The Red-throated Pipit is a winter visitor in small numbers to the irrigated fields of Hufuf oasis, associating and fighting to roost with White Wagtails. A few were seen at Oqair in November, and one was obtained at Salwa on April 2, 1921.

Anthus campestris (Linn.).

A Tawny Pipit was seen at Oqair on November 17, and two at Salwa on April 1, 1921. Perhaps a passage migrant.

Anthus spinoletta coutellii Savigny.

The Water-Pipit is a not very plentiful winter visitor to Hufuf oasis, feeding in the irrigated wheat-fields, and flying over the town with the Wagtails each evening to roost. Two obtained, and these match the Egyptian birds better than *blakistoni*. Breeds in Persia.

Lanius excubitor aucheri Bp. Arabic "Srad," Badawin "Serati."

The Great Grey Shrike is not common, but probably resident; a pair were seen south of Jabrin on February 20. The organs of the male were in breeding condition. One seen in the Jafura Desert on February 13. Breeds on Tanb Island in the Persian Gulf. The male obtained is typical *aucheri*.

Pycnonotus leucotis mesopotamiae Tice.

The White-eared Bulbul is plentiful, but only in the date-palm area of Hufuf oasis; it does not occur at Jabrin, so Hufuf is probably the southern limit. Bulbuls were seen also in the date groves on Bahrain Island. This is the "game bird" of Hufuf to the local sportsmen! Four were obtained, and all have the yellow eye-rim of the Iraq bird, and are larger and greyer below than the Indian race. It is very interesting to find the Iraq Bulbul at this oasis; its distribution east of Fao is not known, but the possibility of its having been introduced into Hufuf and Bahrain from Basra must not be lost sight of.

Sylvia nana nana (H. & E.). Badawin "Shawaila."

The Desert Warbler is the commonest species seen at Jabrin, frequenting bushy areas. Cheesman thought that on February 20 these birds were pairing, and were resident there. However, I do not think this can be taken as a fact, since the birds obtained are in moult and therefore the breeding season must

have been some distance off; moreover, the organs were not enlarged, except to a slight extent in one male. A few were seen at Jabal Arba, but not so plentifully as at Jabrin. Cheesman says the warning note or song is very like a miniature of the English Partridge's.

Five obtained, all more or less in moult; the upper parts have perhaps a slightly greyer tone than birds from India at the same time of year, but individuals cannot be picked out, and as these birds are moulting and therefore showing two states of plumage, the worn and the fresh, we do not think too much stress can be laid on the greyer tone. The measurements and soft parts are the same as in Indian birds.

Sylvia mystacea (Ménét.).

As a belated migrant Ménétries' Warbler was seen on November 19, between Oqair and Jisha. Breeds in Iraq and Persia.

Acrocephalus schænobæus (Linn.).

A female Sedge-Warbler, doubtless on passage, was secured in some rushes by the sea at Oqair on March 29, 1921.

Acrocephalus arundinaceus zarudnyi Hart.

A Great Reed-Warbler was obtained by Sir Percy Cox at Oqair on December 1, 1922.

Luscinola melanopogon mimica Mad.

Almost the only inhabitants of a reed-bed of about two square miles, situated at Umm al Saba, seven miles north of Hufuf, were a pair of Moustached Sedge-Warblers. The male (secured) was in full song, and the other was doubtless the female; the sexual organs were up to breeding size, and there can be no doubt that this pair were actually breeding there. The song resembles a mixture of the songs of the Common Whitethroat and Sedge-Warbler, but is sweeter and has better notes than either. The bird seldom keeps to one theme for more than two or three seconds, and sings continually while clinging to a reed-stem, and is difficult to see. No more were met with anywhere in the oasis.

This Sedge-Warbler was very familiar to me in Sind during the cold weather, and I certainly never heard it singing, nor were the organs of any I obtained there enlarged. Cheesman brought the body of this bird home in spirit, and I found the

testes even then as large as peas. Captain Buxton was certain that this species was breeding in July near Amara, in Iraq; Blanford found it breeding at Shiraz; so that the fact of it breeding in Northern Arabia is not very remarkable, but the month seems an odd one; possibly the reed-bed is too dry later on. The specimen brought back is no doubt *mimica*.
(C. B. T.)

Locustella naevia straminea Seebh.

A male Grasshopper-Warbler was secured in rushes by the sea at Oqair on March 29, 1921; doubtless a passage migrant.

Prinia gracilis hufufæ C. B. Ticehurst & Cheesman, *Bull. B.O.C.* xlv. 1924, p. 19.

The Streaked Wren-Warbler was one of the few common birds in Hufuf oasis, frequenting the date gardens, and was seen at no other place on the mainland, though a Streaked Wren-Warbler was common in similar places on Bahrain Island, but no specimens were obtained there. Several males were in full song on January 11, and their organs indicated that the nesting-season was approaching. A few inhabited the big reed-bed at Umm al Saba near Hufuf.

Eight males: wing 44-48; tail 60-68 mm.

Four females: wing 44-47; tail 61-65 mm.

From *palestinæ*, *iraquensis*, *lepida*, *carlo*, and *gracilis* this race is at once distinguished by the larger and blacker, sharply cut, subterminal band on the tail-feathers; it is paler and greyer above, with paler rufous wing-edges, and purer white below than *yemenensis*; greyer above, whiter below, and more finely streaked on the mantle than *deltæ*; with a much shorter bill than in *natronensis*. The tail-feathers appear to be broader than in all these races.

Phylloscopus collybita abietinus (Nilss.).

The Chiffchaff is a winter visitor in small numbers; not more than three or four were noticed during the winter in Hufuf; six were seen during the forty-mile march from Oqair to Jisha on November 19. At Oqair on March 6 it was plentiful on passage; and it was noted too at Salwa on April 5, 1921. Two obtained are clearly this race.

Monticola saxatilis (Linn.).

One of the first heralds of spring migration northward, a male Rock-Thrush was seen on a wall at Hufuf on March 3,

the only one met with. The earliest record in Iraq is March 30.

Monticola solitarius (P. L. S. Müller).

A Blue Rock-Thrush was seen at Oqair on November 17, the only record. Status doubtful, probably a winter visitor.

Phenicurus ochrurus phænicuroides (Moore).

One at Hufuf on January 11, and another seen in South Hasa on March 1, are the only records of the Black Redstart. Winter visitors in small numbers. Breeds in Persia.

Saxicola torquata (Linn.).

The Stonechat was seen at Hufuf on January 28, and another at South Jabrin on February 18. Winter visitor in small numbers. Noted on passage at Salwa on April 5, 1921.

Ænanthe ænanthe (Linn.).

Several Wheatears were seen at Bahrain Island on March 27, and at Oqair on March 29, 1921. Evidently on passage.

Ænanthe deserti oreophila (Oberh.).

Ænanthe deserti atrogularis (Blyth). Badawin "Daigīn," or "Abu Zarā."

The Desert Wheatear is by far the most plentiful of its tribe in the Hasa and Jabrin deserts, and males far outnumbered females, which fact one of us had already noted in the Sind Desert. Two specimens obtained belong to the race *oreophila*, the rest are *atrogularis*. The series shows beautifully the seasonal change which takes place in the loss of the rufescence on the upper parts and of the white on the throat, till in March the bird has greyish upper parts and a black throat. Breeding in Tibet, *oreophila* has a comparatively narrow zone of distribution in winter—E. Persia and Beluchistan, N.E. Arabia to Socotra.

Ænanthe isabellina (Cretz.).

Cheesman thought that the Isabelline Wheatear was a passage migrant, as he saw none till February 20, and several were subsequently seen and three obtained. The organs of one on February 28 showed the approach of the breeding-season. One was seen at Oqair on November 18. Status uncertain; probably a passage migrant.

Ænanthe leucomela leucomela (Pall.).

The Pied Wheatear is evidently a passage migrant; the first was seen on February 22 at Jabrin, and it became plentiful during the next week. Several were seen on passage on Bahrain Island on March 27, and at Salwa on April 5, 1921. In Iraq the first arrivals were noted on March 1.

Ænanthe monacha (Temm.).

A female of the Hooded Wheatear was secured on Jabal Dukhan, Bahrain Island, on March 26, 1921. Status unknown; it seems to be rare everywhere, and no doubt resident where it occurs.

Ænanthe xanthopyrna chrysopygia (De Fil.). Arabic "Umm-al-henna" = "mother of henna."

The Red-tailed Wheatear is rather a rare winter visitor; a few were found inhabiting the sandstone hills of Jabal Abu Ghanima (500 feet above sea, 300 feet above plain) in January, and in a similar situation in Jabrin on February 20. Three obtained belong to this race, which breeds in Northern Persia from 5000 to 12,000 feet.

Hirundo rustica rustica Linn.

Swallows in very small numbers were noted up till December 5, after which date none was seen until February 1, when three were met with at Hufuf travelling north. On the march from Hufuf to Jabrin across the desert on February 13, and again on the return journey on February 25, single Swallows appeared, and after snapping up a few flies almost off the camels' noses disappeared into space again. On March 27, 1921, Swallows were common on Bahrain Island, and were about to breed there. Noted on passage at Salwa on April 1-3, 1921. In Lower Iraq, too, Swallows are only absent during December and January.

Delichon urbica (Linn.).

Two House-Martins were seen on Bahrain Island on March 25, 1921; they were passage migrants.

Ptyonoprogne rupestris (Scop.).

A solitary Crag-Martin was seen over Hufuf town on January 1. Several were seen, and one obtained during a marked passage northward up the Salwa coast on March 31, 1921, and one was seen on Bahrain on March 27, 1921.

Odd birds apparently winter, the bulk being passage migrants. This Crag-Martin has quite a different "chirrup" from the paler *P. obsoleta*, which "chortles"; it also has a more tired flight, rising languidly upwards and falling again like a belated Swallow left behind in autumn, and too weak to face migration.

Ptyonoprogne obsoleta obsoleta (Cab.).

The Pallid Crag-Martin was common at Hufuf, but not seen at Jabrin. Many birds frequented the town during the day, hawking over the bazaar, which even in winter supported a multitude of flies. They breed in the cliffs of the sandstone hills in the vicinity, and old nests were found which were being utilised at night for roosting purposes. The nests, which were not built in colonies, were open at the top like that of a Swallow, and were placed for protection under ledges which overhung them. They were composed of the usual mud pellets, and lined with grasses and Jerboa hair, probably filched from old pellets of the Desert Eagle-Owl, which had a perch below. These Crag-Martins are very frightened of rain, and at the first few drops of the rare small showers they all dashed for the mud walls of the forts, where they clustered together in thirties and forties, waiting till the shower ceased. A furious fight was witnessed between two birds high up in the air; several times in attacking they clung together viciously, falling thirty to forty feet ere they let go. The note of this bird is a typical Martin-like chortle.

Four males, wing 117-122; four females, wing 119-124 mm.

This is a fine series in good plumage. When compared with a series at the same time of year (November and December) from Egypt (Mokottam Hills), the Hufuf birds are not really paler, though odd ones may be when matched with single birds, and therefore I keep these Arabian birds under the typical race; *P. o. reichenowi* from Sinai and Suez is surely the same also. I have seen none thence, but Palestine birds seem to be typical. These Crag-Martins vary a good deal and considerably so seasonally; this series from Hufuf and those from Egypt are considerably paler than Sind birds, though Sind winter birds match pretty well Egyptian ones obtained in May. The Sind-Beluchistan bird must stand as *pallida*, notwithstanding the fact that it is darker. (C. B. T.)

The typical race has been taken at Fao as a wanderer, and in South-western Persia.

Riparia riparia (Linn.).

Odd Sand-Martins were seen up to December 1—belated passage migrants; no more were seen, but in 1921 three flocks were met with on Bahrain Island on March 27, at Oqair on the 29th, and near Salwa on April 3. In Lower Iraq (Fao) also, this species is only absent during the mid-winter months.

Micropus murinus murinus (Brehm.).

A few Pallid Swifts apparently spend the winter in Hasa; six were seen hawking over Hufuf town on January 1, the first seen, and ten were seen at Umm al Saba, near Hufuf, on the 28th. By February 8 the numbers had increased and birds were seen on most evenings over Hufuf. On April 1, 1921, several parties were seen flying north up the coast at Salwa, and one was obtained.

Caprimulgus europæus sarudnyi Hart.

This Nightjar was not obtained in Hasa, but one was seen on board the steamer in the Arabian Sea between Mukalla and Ras Fartak, Hadhramaut, three miles from the coast on October 26, 1923; by a curious coincidence one was caught in the same position thirty miles off Ras Fartak on April 12, 1924. This bird is just a shade paler than the typical race and has the white spot on the outer web of the second primary. It is rather suggestive that Ras Fartak is on a line of migration from Arabia to Africa; southward of this point birds would strike Africa at its north-east point in Somaliland. The earliest record in Iraq (Fao) is April 7.

Merops apiaster Linn.

A Bee-eater was seen on passage at Oqair on March 31, 1921. It arrives in Iraq at the end of March, and breeds in South-western Persia.

Merops persicus persicus Pall.

The Persian Bee-eater was noted at Bahrain Island on April 10, 1921; it arrives in Iraq about middle to end of March, and breeds.

Upupa epops epops Linn. "Hudhud."

The Hoopoe does not winter in Hasa; the first was seen on March 1 at Dalaiqiya, flying north, travelling swiftly, about a foot over the desert, evidently a leader of the spring migration.

Three were seen at Oqair on the 7th, where in 1921 some were still on passage on March 29. In Iraq the earliest arrivals were seen at Zobeir on February 28. Breeds on the Persian Plateau.

Alcedo atthis pallasii Rchb.

The Kingfisher is not uncommon along running streams in the Hufuf oasis, where it is very tame. The little fish *Cyprinodon dispar* is very numerous in these streams flowing from springs, and would provide ample food. No doubt a winter visitor; one obtained belongs to this widely distributed race.

Bubo bubo desertorum Erl. "Fayum."

These Eagle-Owls live in the crags and caverns of the sandstone hog's-back hills that are scattered about the desert round Hufuf oasis. Round Jabrin there are similar suitable caves, but no Owls could be located there. The hills occupied by the birds are strewn with pellets in all suitable crannies; the pellets contained remains of Jerboas, Bats, *Ammomanes*, Scarab Beetles and Scorpions. The white sandstone when weathered becomes pinkish and nearly matches the colour-tones of the Owls, as it does the colour of the *Ammomanes*: if in the latter case one supposes that it is a matter of colour protection, in that of the Owls it must surely be camouflage, as the Owls can hardly have any enemies to be protected from. Yet Cheesman found them very difficult to approach; they generally sit at the mouth of some cave and can be detected with field-glasses, asleep but watchful, with ear-tufts erect. On being disturbed, they leave the hills which offer cover for near approach, and settle out in the flat desert, where no nearer approach than a hundred yards is possible, and that only by crawling.

Two pairs were obtained: ♂ w. 367, ♀ w. 368; ♂ w. 343, ♀ w. 402 mm. Judging by the organs, the breeding-season should be in February. As a series these four are fairly uniform; in one pair the male is slightly paler, in the other pair slightly darker than his mate.

This is the palest form of Desert Eagle-Owl and matches exactly those obtained on the Angus Buchanan Sahara expedition in the Air (Asben) district, S. Sahara, and practically matches two birds in the British Museum from Shendi (Nubia) and Darragh (Sudan). We thus have two forms—an absolute desert bird, very pale, extending right across desert Africa into Arabia, and according to Dr. Hartert to Palmyra in Syria, and a darker form in Algeria and Tunisia, etc. For a discussion

on these races see *Novitates Zool.* xxxi. 1924, pp. 16-17. I have followed Dr. Hartert in using *desertorum* for the pale race—an apt name enough, but unfortunately Erlanger's type came from a somewhat intermediate area.

Tyto alba alba (Scop.). “Umm-al-Sakr” (mother of rock).

The screech of the Barn-Owl was heard on several occasions in Hufuf, but no birds were ever seen, though Cheesman heard of one having been shot to feed the Governor's falcons. Pellets were found in a ruined castle at Jabrin oasis, which from the size were attributed to this Owl. Several pairs are resident on Bahrain Island, and an old nest was found in a tomb on March 27, and a bird obtained. This, a male (wing 287 mm.), is pale above and white unspotted below, and can be matched by many European examples.

Gyps fulvus (Habl.).

Two Griffon Vultures were seen round camel carcasses on the caravan route from Oqair to Hufuf on November 19.

Neophron percnopterus.

The Egyptian Vulture is resident in small numbers: one seen on Jabal Abu Ghanima, Hufuf, on January 19, and a pair at their nest on the ledge of a high cliff in Jabal Arba, Hasa, on March 1.

Circus macrourus (Gm.).

The Pallid Harrier is a scarce winter visitor; single birds were noted at Hufuf on November 21 and December 29, and at Jabrin on February 20. A pair at Oqair on March 29, 1921, and at Salwa oasis on April 4. A male was caught at sea, thirty miles off the Hadhramaut coast, on April 11, 1924.

Buteo vulpinus (Gloger) (= *desertorum* auct.).

A nest of a Buzzard with three young was found on Jabal Kharma Zarnuqa on February 29; one of these was kept alive till March 23 with a view to identification of the species. The nest was on the ledge of a cliff forty feet from the ground and built of sticks; the ledge was just wide enough to crawl along. The young had been fed on dismembered Gerbils (*Meriones* sp.), and a fresh-caught one was in the nest. The parent birds were seen, but kept at too high an altitude for identification.

The feathering young has the cere and legs pale yellow, iris brown, and would pass as this species.

Aquila sp. ?

An Eagle with almost black plumage was seen at Jabrin on February 17; it chased a Hare which had been moved into the open, and made several stoops, but being somewhat baffled by human proximity it missed each time, and the Hare escaped down a burrow.

Accipiter nisus (Linn.).

A male Sparrow-Hawk was seen over Hufuf town on November 26 and subsequently, and on one occasion with a female. One seen at Bahrain on April 10, 1921. Doubtless winter visitors.

Milvus migrans migrans (Bodd.). Arabic "Hadayiya."

A Black Kite was obtained at Zarnuqa on February 28, when a pair came over the camp; one was seen on March 3 at Hufuf. One was noted at Bahrain Island on March 27, 1921. All these were doubtless on passage to their breeding-grounds in Persia. The badawin informed Cheesman that these Kites do not breed in Hasa.

Falco peregrinus Tunst. Arabic "Shahin."

The only wild Falcon was seen at Oqair on March 29, 1921. The Governor of Hufuf had about thirty trained falcons—Peregrines and Sakirs—which were all bought from dealers. Two such merchants travelled on the steamer from Basra in November, bound for Persian Gulf ports, and had with them fifty falcons of both species. They were mostly birds of the year, and were valued at from £10 to £20 each. The Peregrines were said to have come from Zobeir and the Sakirs from Baghdad; the Arabic for the latter is "Hurr."

Falco aesalon pallidus (Sushkin).

A Merlin was obtained at Ain al Najm, near Hufuf, on February 1; another was seen at Zarnuqa on February 11, and one near Jabrin on the 21st. Probably a winter visitor. The one obtained is an exceedingly pale bird, many shades paler than *insignis*, which again is distinctly paler than the typical form.

Falco tinnunculus Linn.

A Kestrel was seen over Hufuf on January 21; one at Jabrin on February 20, and one at Salwa on April 5, 1921. Perhaps the typical form wintering.

Phalacrocorax carbo sinensis (Shaw & Nodder). Arabic "Logha."

Many Cormorants were seen on the reefs and small islands near Bahrain in company with the smaller Socotra Cormorant.

Phalacrocorax nigrogularis O.-Grant & Forbes.

The Socotra Cormorant was very often seen resting on the reefs and rocky islets between Bahrain Island and Salwa. It is easily distinguished from the Common Cormorant by its smaller size. A large flock of many thousands passed down the coast off Ras Sufaira, south of Oqair, on March 30, 1921. The leading birds plunge into the water to fish, and on emerging join the rear-guard, so that the progress of the flock is continuous. An immense cloud of these birds were in Bahrain Harbour on March 11. It is resident, of course, breeding on many islands in the Gulf.

Anas sp. ?

Six Ducks, about the size of Shovellers, were seen flying round the date gardens at Hufuf, and furnish the only record for the oasis in five months, November to early March. The extensive reed-beds and shallow flood-land seem ideal for Duck, yet they are absent, and the explanation probably is that the floods, being spill-water from irrigation, are highly charged with saline matter which thickly encrusts the bottom and stems of reeds, and so probably checks delicate water-weeds and animal life. The running streams of fresh water pass through gardens crowded with gardeners at work.

Querquedula crecca crecca (L.).

Nine Teal were observed on some flood-water at Hufuf on December 28; on being disturbed they departed, to be seen no more.

Phœnicopterus ruber antiquorum Temm.

Flamingoes were seen at Oqair on November 17 and March 6, and near Salwa on April 10, 1921. A non-breeding visitor to the district, but breeding at the head of the Persian Gulf.

Ardea purpurea Linn.

A Purple Heron was seen on Bahrain, March 27, 1921. A wanderer.

Nycticorax nycticorax nycticorax (Linn.).

The familiar "squark" of the Night-Heron was heard on the night of December 14, as the birds passed over. Like the Ducks, they probably found the locality unsuited to them, and they departed whence they came. It breeds in Iraq.

Demigretta sacra asha (Sykes).

The Reef-Heron was seen on the shore at Oqair on November 17. It breeds on the Gulf.

Chlamydotis undulata macqueeni (Gray). Arabic "Houbara."

The Houbara was not actually seen, but evidence goes to prove that in rainy years they may be plentiful; like true nomads, they follow the vegetation. Fresh footmarks were seen in the sands of Jafura desert on February 14, and again at Jabrin on the 21st. Three eggs taken on February 14 between Hufuf and Riyadh were given to Cheesman. Mr. Philby found a nest of four eggs on April 10, 1918, near Shauki, between Hafal-al-Batin and Riyadh.

Burhinus ædicnemus astutus Hart. "Burhan."

Three Norfolk Plovers were seen and two obtained in the Jafura desert on February 27. Footprints seen in the Wadi Sahba on the 25th. These birds were easily approached on camels by waving a white shirt at the end of a camel-stick, when they immediately squatted! Both these birds are typical *astutus*, and were doubtless resident. One was shot at Salwa on April 4, 1921, as it came to drink at the well; this is a much more rufous bird and matches well *saharæ*. This latter race is by no means satisfactory; it is found in North Africa as a breeding bird where *astutus* does not occur, and yet in Iraq, Central Arabia, and Beluchistan there occur birds (records August to April) which I cannot differentiate from *saharæ*, and they are in the breeding area of *astutus*. They can hardly be migrants. (C. B. T.)

Cursorius cursor (Lath.).

Three Coursers seen in the desert near Hufuf on December 31 were the only ones met with.

Capella gallinago (Linn.).

Two Snipe were flushed at Umm al Saba, near Hufuf, on January 6. These were in the huge reed-bed two miles long

by one mile broad. This reed-bed was a most disappointing place for birds: it is covered with tall reeds and rushes and has open spaces of water nowhere more than two to three feet deep, and not a sound of bird-life breaks the stillness. A whole day was spent by Cheesman and his servant wading through it and beating it out for birds, and beyond the Snipe, one Teal, one Black Partridge, a pair of Moustached Sedge-Warblers, and a Wren-Warbler there was nothing to be found! Like other waters, it is probably too saline.

Erolia minuta (Leisler).

A flock of Little Stints were seen on the edge of a flooded depression at Hufuf for several weeks during the winter.

Tringa totanus (Linn.).

A Redshank was seen at Hufuf on December 29; the call was first heard high up in the sky to the north, and the bird descended and settled on the edge of shallow flood-water, but after a moment departed again to the north. Noted on Bahrain Island on March 27, 1921.

Tringa ochropus Linn.

A Green Sandpiper was seen at Umm al Saba on January 28.

Limosa lapponica lapponica (Linn.).

The Bartailed Godwit was seen at Oqair on November 17, and one was obtained there in breeding dress on March 29, 1921.

Charadrius alexandrinus alexandrinus Linn.

A flock of one hundred Kentish Plover were seen resting near flooded land at Hufuf on December 17, where they only remained a few days. Resident on the coast; a nest with three eggs was found at Oqair on March 29, 1921, and this species was seen at Bahrain Island on April 10.

Charadrius leschenaultii Less.

Several Sand-Plovers were seen on the sandy plain above high-water mark at Oqair on November 17.

Larus genei Brème (= *gelastes* auct.).

Slender-billed Gulls were seen on the Salwa coast on April 10, 1921. Breeds on the Persian Gulf.

• *Sterna (Hydroprogne) caspia caspia* (Pall.).

Caspian Terns were seen in Bahrain Harbour on March 27, 1921. Breeds on the Persian Gulf.

Sterna albifrons saundersi Hume.

A pair of Saunders' Tern were seen and one secured on Bahrain Island, April 11, 1921. One was caught exhausted off the Hadhramaut coast on May 8, 1923. Very likely this race breeds at the southern end of the Persian Gulf; at the northern end the breeding bird is *S. a. albifrons*.

Podiceps cristatus cristatus (Linn.).

A Great Crested Grebe in breeding dress was found dead on the beach at Oqair on April 1, 1921. It is known as a winter visitor to the Gulf and Mekran coasts and breeds in Iraq.

Fulica atra Linn.

A Coot was seen on an open lake of spill-water in Hufuf on December 15. It was not there next day and was not seen again.

Columba livia Gm.

A flock of twenty Rock-Doves were seen on a hill near Jabrin on February 21, but would not allow approach nearer than half a mile. It is evidently resident in quite small numbers; a deserted nest in which young had been reared the previous year was found in a ruined castle at Jabrin oasis, and a roosting-place in a dry well. None were seen elsewhere and, unlike most eastern towns, Hufuf does not support a semi-tame horde of pigeons. It was unfortunate that no specimens could be secured.

Pterocles senegallus (Linn.). Arabic "Ghatta."

: From time to time small flocks of this Sand-grouse were met with in the desert round Hufuf and Jabrin, and on one occasion several flocks were seen watering at Hufuf. They are evidently not very abundant, though very likely more numerous in years of exceptional rain. The Arabs say that animals and birds follow the rains from district to district since life depends on vegetation, and this is no doubt quite true in the case of Houbara, Sand-grouse, and Gazelle.

Two males were obtained at Hufuf on March 1. Spotted

Sand-grouse vary considerably *inter se*, and slight differences can be seen between these two and a series from India; however, as I have already pointed out, birds from North Africa vary so, and some are really not distinguishable from Indian ones, that at present I prefer not to separate any races.

(C. B. T.)

Francolinus francolinus (Linn.). Badawin "Warāra."

A male Black Partridge was flushed in the reed-beds of Umm al Saba, near Hufuf, on January 6. This was the only one seen in the Hasa oasis in spite of diligent search and several expeditions to look for it. The local people seemed to know little of it, but gave it the above name when the bird was actually flushed at their feet. It is probably nearly extinct owing to the prowling garden workers armed with fowling-pieces, who shoot anything from a Bulbul upwards! No foot-marks in the sand or mud by the reed-bed could be found, so that there cannot be many there.

I think that there can be now no doubt that the suggestion that the "Grey Partridge" met with by Mr. Philby in Central Arabia (*Bombay Nat. Hist. Soc. Journ.* xxviii. p. 205) was *F. pondocermanus* is incorrect. It was understood then that Mr. Philby was certain the birds were *not* See-see, but further inquiries tend to show that they were. The See-see does not appear to be found in the Hasa and Jabrin hills. (C. B. T.)

Struthio camelus syriacus Rothsch.

The Ostrich was once to be seen in the deserts round Jabrin. The Al Murra tribesman who acted as guide said his grandfather was the last man to kill one there. The improvement in weapons used by the tribes in the last two generations has probably been the cause of the disappearance of the Ostrich in this district; according to native report they are still to be found in the Great South Desert near Najran. See also *Ibis*, 1923, p. 208.

APPENDIX III

REPTILIA AND BATRACHIA

FROM HASA, JAFURA, AND JABRIN IN EASTERN AND CENTRAL ARABIA

Collected by Major R. E. Cheesman in 1923-1924 and presented to the British Museum

Mr. H. W. Parker of the British Museum (Natural History) has identified the specimens, and their approximate distribution is indicated by him by letters referring to the first paragraph. His remarks have been included in the field notes.—R. E. C.

All the specimens collected belong to previously-known species. Twenty-three Lizards representing ten species, a single Frog, but no Snakes, are present. Of these species, some are confined to Arabia (*a*), some extend only northwards into Persia and N. India (*b*), others only westwards into Egypt and N. Africa (*c*), and others again both northwards and westwards (*d*).—W. H. P.

LACERTILIA

GECKONIDÆ

1. *Ptyodactylus lobatus* Geoffroy (*c*). January 19.

2150. Two half-grown specimens from Jabal Abu Ghanima, Hufuf, in bad condition, but apparently agreeing closely with the typical Arabian form. A desert Gecko inhabiting crevices in sandstone hills. Has large circular discs or lobes at end of the toes. This digital expansion is here at the extremity of the digits. Use: for adhesive purposes. The only method of securing them was by shooting with the .410 collecting gun; the cartridges were emptied, half the powder reloaded, the wad replaced, and the rest filled up with fine sand instead of shot.

2. *Hemidactylus persicus* Anderson (*b*). November 26: Hufuf.

5041. Two specimens, ♂ and ♀, from Hufuf town. This species has not been previously recorded in Arabia south of

Mesopotamia. Arabic: "Pursee" or "Thator." A house Gecko. In the roof-beams of Hufuf houses. They are not very active now, but come out most evenings. They are almost a transparent white in colour. Digital expansion for adhesive purposes, at the base of digits, the terminal phalanges not being expanded.

AGAMIDÆ

3. *Agama flavimaculata* Rüppel (c). February 2 and 24.

5170. ♀, Jabal Aquila, Jabrin.

5209. Two specimens, ♂, Jabrin.

Only found on gravel plains. They remain motionless, depending on mimicry for protection, as they resemble very exactly their environment in colours and shading. Once disturbed, they dash off, tail in air, and can run as fast as a man. These *Agamas* did not seem to have any holes to run to. They bite hard if they can get their gargoyles-like face round your finger. Fingers and toes not fringed.

4. *Phrynocephalus maculatus* Anderson (b). February 16 and 20.

♂, Salwa Bay.

5171. ♀, Jabal Aquila, Jabrin.

5178. ♀, S. Jabrin.

Not previously known from Arabia. These were mistaken by me for *Agamas*, which they resemble in the distance; they also run like them. They do not appear to go to earth when pursued. Fingers and toes not fringed. Habitat, gravel plains.

5. *Phrynocephalus arabicus* Anderson (a). February 26.

Half-grown, Salwa Bay.

5211. 1 ♂, 2 ♀, Jafura.

Seen only on loose sand-dunes and not on hard gravel. They are found in the scanty shelter afforded by desert bushes and when disturbed run out on to the open sand. After going about ten yards they stop and kick with the hind-legs, working the body into the loose sand. The head, still erect, is left exposed. When all is hidden, down goes the head and disappearance is complete. Each specimen went through exactly the same performance. Here the lateral scales of the digits are much enlarged, forming a serrated fringe on either side. This increases the plantar and palmar surfaces and is an adaptation to walking on the loose sand which is their habitat.

6. *Uromastix microlepis* Blanford (b). January 4.

5117. Hufuf (dried specimen).

Arabic "Thub." Spiny-tailed Lizard. Eaten by badawin or brought into towns alive for sale. This specimen was bought in Hufuf market for 30 tawila (sixpence). The body cavity contained two apparently distinct intestines, crammed with green shoots of desert shrubs finely masticated into short lengths. This appearance is due to an enormous enlargement of the first part of the large intestine. This enlargement is probably an adaptation to vegetable food. Cellulose is not dissolved by any vertebrate gastric ferment, and until cellulose is dissolved the cell-contents of food-plants cannot be digested. Bacterial fermentation is essential to remove the cellulose, hence the divided stomach of sheep, etc., providing one compartment for bacterial fermentation and one for commencement of digestive processes.

We saw several on the way to Jabrin in February. They live in large, self-dug holes as big as a rabbit's earth, sometimes with two entrances—generally one—and always in firm, stony ground. When surprised too far from the hole to escape, they squat and lie still; at other times they make all speed for home, and the badawin drop from their camels and give chase and can run a little faster than the lizard. They bite hard and can give a sharp rap with the powerful, spiny tail.

It is said that South American Iguanas taste like chicken. No such recommendation attaches to their Arabian kinsman.

LACERTIDÆ. Arabic "Damus" = all Lizards.

7. *Acanthodactylus boskianus asper* Audouin (c). February 20.

5178. ♂ and half-grown, S. Jabrin.

5167. Half-grown, Jafura. This specimen shows the subocular shield bordering the mouth as in *A. boskianus euphraticus* Boulenger, but in all other characters it agrees with *asper*. Badawin "Khusawi." These are long-tailed and fleet of foot and belong to the true Lizards. They live in holes among the roots of desert bushes growing in loose sand. The bushes are isolated and scattered at distances of about twenty yards. The Lizards are often found at some distance from their home, and exciting chases took place from bush to bush before these specimens were secured. Has the strongly fringed digits and sandy habitat.

8. *Acanthodactylus cantoris* Gthr. (*b*). March 1921.

883. Two specimens, Salwa. Lizards with long fringes to toes.

Determined by Miss J. B. Procter.

9. *Acanthodactylus scutellatus* forma typ. Dum. and Bibr. (*c*).
February 23—among sand-dunes.

5209. ♀, Jabrin. In the size of the dorsal scales this specimen tends to resemble *A. fraseri* Boulenger from Lower Mesopotamia. *A. scutellatus* has not hitherto been recorded further east than Basra. Another of the true Lizards, very similar in the distance to the above and with the same habits and the strongly fringed digits.

10. *Eremias brevirostris* Blanf. (*b*). March 1921.

882 and 884. Oqair and Salwa. A Lizard with spots, plentiful, and runs fast.

Determined by Miss J. B. Procter.

SCINCIDÆ

11. *Mabuia septemlineata* Reuss (*d*). December 16.

5080. ♀, Hufuf.

Plentiful in Hufuf palm gardens. This is the well-known horizontally-striped Skink. The skin is smooth and shiny, and the tail is short and thick. In Hufuf on March 4 we went for several miles past palm-trees growing along the path at distances of 100 yards. On the base of each trunk was one of these Skinks, basking in the sun. Not seen outside the garden area. This species has no digital fringes.

12. *Scincus mitranus* Anderson (*a*). February 11, 15 and 26.

5168. Ad. Wadi Sahba.

5158. Ad. Zarnuqa, Hasa.

5212. Ad. Jafura.

I did not see this species in the open; a remarkable Skink from the sand-dune desert only. A flat upper lip gives a wedge shape to the head, adapted for diving head-first into the sand. Colour above, pale pinkish; below, white; with about half a dozen (number not constant) dark red vertical bars straggling irregularly down the sides looking like congealed blood. Their presence is disclosed by their footprints on the steep side of

drift sand to the leeward of the high, moving dunes. Where the track ends there is a round mark where the Skink has buried itself. The badawin plunge their hand about 2 feet into the soft sand and usually produce the Skink. I had an exhibition of their marvellous speed in burying themselves. My boy was in my tent, pitched in soft sand, and was transferring one of these Skinks from one tin to another, when it wriggled its head round towards his fingers and he dropped it. I saw this happen and plunged to the ground at the same time as the Skink, and grabbed, but it was already out of sight below the sand as if by magic. I was told in Hufuf that a certain Lizard is caught in the desert and sold at good prices in Bombay for medicine. It was called Dāmus, which is also a general term for Lizards of all denominations. While not able to speak with certainty, I think it is this Skink. In this species the digits are flattened and the scales produced laterally to a very large extent, so that the hand and foot are almost paddle-like. A closely allied species is sometimes known as the "sand fish," owing to its ability to swim through the sand. It was even described by ancient writers in works on fishes.

BATRACHIA

13. *Rana esculenta ridibunda* Pall (d).

5042. ♂, Hufuf.

Hufuf springs and streams. Plentiful. Edible Frog. On November 30 the chorus of Frogs in the gardens at Hufuf could be heard in the evening from my house half a mile away. On January 24 I noted that the males had assumed their courting dress. The skin becomes an emerald-green with a pale line down the centre of the back, and the eye is of shining gold of extra brilliance. The females are brown with circular brown spots. They were still very noisy and were pairing. They have 400 miles of desert between them and the next fresh water at the Shatt al Arab.

I also saw Water Tortoises commonly in the Hufuf streams; they appeared to be the same as those I had previously brought home from Bahrain springs—the Caspian Water Tortoise (*Clemmys caspica*). No Snakes were seen, but several cast skins were noticed in Hasa and Jabrin. They were probably hibernating, and I should say are not plentiful even in summer.

REPTILIA OF THE PERSIAN GULF

In addition to the Reptilia of the Arabian mainland, a list of specimens obtained by Sir Percy Cox's collector (La Personne) and myself on islands of the Persian Gulf is given below as a matter of interest. The specimens were kindly examined and reported on by Miss Joan B. Procter in 1922, and the identification is hers, and she was good enough to add a few notes to give us some idea of the distribution of the various species, which have been included with the field notes.—R. E. C.

CHELONIA

Clemmys caspica Gem. Water Tortoise. Bahrain Island.

Plentiful in the flowing springs of Bahrain. *Dist.*—Caspian Sea to Persian Gulf.

LACERTILIA

Fam. GECKONIDÆ

Alsophylax tuberculatus Blanf. Tanb Island.

Found on rocks. *Dist.*—Mesopotamia; S. Persia to Sind.

Hemidactylus turcicus L. Tanb Island.

Dist.—Borders of Mediterranean and Red Seas; Sind.

Fam. AGAMIDÆ

Uromastix microlepis Blanf. Jabal Dukhan. Bahrain.

Spiny-tailed Lizard. This was so small that I mistook it for a smaller species. It had dug out a burrow for itself, and its colour was black with red spots, much darker generally than that of the mature beast. *Dist.*—Head of the Persian Gulf.

Fam. LACERTIDÆ

Eremias brevirostris Blanf. Tanb Island, March, 1921.

Dist.—Persian Gulf; Punjab.

OPHIDIA

Subfam. COLUBRINÆ

Zamenis ventrimaculatus (Gray). Gray's Whip Snake. Bahrain, March, 1921.

Non-poisonous. Two specimens obtained by Major Daly

on Hasan Island off Bahrain. *Dist.*—From the Euphrates to Kashmir and N.W. India.

Subfam. HYDROPHIINÆ

Hydrophis ornata (Gray). Ornamented Sea Snake. One mile off Tanb Island, April, 1921.

Poisonous. Yellowish-white with sea-green bands, belly white. Both species of these Snakes are common in the Persian Gulf, sleeping coiled up and floating on the surface of the sea on calm days, and scarcely moving when touched by the wash of a steamer. The tail is flattened instead of being round and tapering as in other Snakes. *Dist.*—Mouth of Persian Gulf and coasts of India, Ceylon to New Guinea and N. Australia.

Hydrophis cyanocincta (Daud). Blue-ringed Sea Snake. Khor Abdulla, top of Persian Gulf, May, 1921.

Poisonous. Four feet in length. Black bands, belly white, tail flattened, seen on calm sea as above. *Dist.*—Persian Gulf to coasts of India, China, Japan and Papuasias.

Subfam. VIPERINÆ

Echis carinatus (Schneid). Saw-scaled Viper. Tanb Island, April, 1921.

Poisonous. La Personne says some were of a sandy colour, and others were dark, resembling the rocks, he adds. The island swarms with these Snakes, which take a heavy toll of the live-stock. They issue in the warmer months, April and May. To see if they were poisonous he allowed one to bite a tropic bird (*Phæton*), and it died within a minute. Older editions of *The Persian Gulf Pilot* mention the large number of Snakes on this island. When I visited Tanb on September 23, 1920, and again in March, 1921, I failed to find a single Snake. They are small and thin. *Dist.*—Deserts or sandy districts of Africa north of equator; S. Asia from Transcaspia and Arabia to India.

BATRACHIA ECAUDATA

Fam. RANIDÆ

Rana cyanophlyctis Schneid. Bahrain Island.

Dist.—Southern half of Arabia, and Baluchistan to Malay, and from the Himalayas to Ceylon.

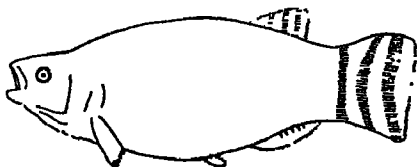
APPENDIX IV

FISH

Cyprinodon dispar—"The Hot Spring Fish."

Mr. J. R. Norman, of the British Museum, has kindly identified these fish for me. The largest male (measured in Hufuf): length 79 mm. (from end of tail to tip of lower jaw); greatest width 14 mm.; greatest depth, belly to back, 22 mm.

Iris silvery white. Mouth reddish, spreading towards eye (like a breeding male stickleback). Lower gill and belly silvery white; belly has obsolete narrow vertical dark stripes. Back bright olive-green with chequering of small sky-blue spots and



horizontal rows which increase in size towards sides and belly. Pectoral fin transparent lemon-yellow. Anal fin bright lemon-yellow with small black-and-white check along the margin nearest body. Dorsal fin (near tail) transparent olive-green chequered with narrow black vertical stripes. Tail transparent silver with two broad vertical black bands from top to bottom, which take up most of the tail and make three narrow silvery bands of the rest. The black bands are a variable feature, and some specimens have them joined together.

The largest female measured 75 mm. (= 3 inches); greatest width 16 mm.; greatest depth 22 mm.

Colour, dull olive-green. The small fins lack the chequering of the males, and the tail is without the black bands.

The adults were rare and very difficult to catch, but immature fish swarm in all the spring-fed streams of Hufuf oasis. If a bather sits still in the water, shoals of these small fish approach and nibble his legs. They are too small to bite hard, but the contact of their teeth can be felt. I would not believe this till I saw it for myself. At other times they can be seen on the mossy sides of the streams, tearing something off, and they often turn upside down with the exertion. The mouth comes out in a kind of socket, and there is a row of teeth along the outer edge of the jaw. These teeth seem proportionately smaller in adult than in small fish. Lower jaw teeth are flat and sharp, and when magnified a red vein can be seen running up each tooth. The lower jaw being undershot gives an aggressive bulldog appearance. Native boys catch the fry in baskets woven from date-leaves, but they are not eaten. The fish greedily tear a date to pieces if it is dropped in the water, thousands joining in the mêlée.

The material of the species *Cyprinodon dispar* at the British Museum is scanty, as all collectors have caught half-grown fish. Probably, thinking they had the adults, they did not try for bigger specimens, or perhaps they were unable to catch them. Thus the Hufuf specimens are the first really full-grown fish to be acquired, and there is little to compare them with. It seemed to me, from an examination of a plate of *C. dispar*, that the typical dorsal and ventral fins were very much bigger and longer in proportion to the fish's size than are the same fins of the fish from Hufuf, and it is certain that an extreme development of fin would be unsuitable in the swift-running waters of the Hasa. It is possible that in stagnant waters a more ornamental fin is grown, whereas in streams the streamline form is a necessity and the fins are smaller. We have no field notes to help us to arrive at any decision. There are specimens from Muscat and Basra, but there is nothing to tell us whether they were in still water or not. It is said there are two kinds of fish in the Bahrain springs, but we have no specimens thence and it would be useless to speculate as to their identity. Colonel Miles, who was Political Agent at Muscat in 1876,¹ mentions hot springs at Nakhl near Muscat which he visited. He found the temperature was 106° F., and remarks that there were small fish in the streams flowing from them

¹ Colonel S. B. Miles, *Geog. Journal*, 1901, p. 470.

where the water was still warm. Dr. Jayakar sent specimens from Muscat which were identified at the British Museum as *Cyprinodon dispar*, but we do not know what spring they came from. The hottest spring in Hufuf oasis is Umm al Saba. Where it flows from the basin, I saw fish swimming and found the thermometer registered 101° F. In the summer the shade temperature of the air would certainly be well over 100° and would tend to raise that of the water rather than cool it. Therefore it is established that these fish can survive a water temperature of 101° and probably several degrees hotter. By the medical definition, a hot bath commences at 96°, and 101° is as hot as you can stand it. The natives say that if the fish are put in cold water they die. The temperature of the hottest tanks in the tropical section of the Aquarium at the London Zoological Gardens is 80° F.

There are two points connected with these fish that would be of great interest especially to biologists. Firstly, to know whether they have been specialised to withstand high temperatures which would instantly kill most other species—and the impression when your hand is plunged in the water is that it would almost cook them as well. Secondly, to learn how they have been able to establish themselves in an isolated desert oasis, separated by hundreds of miles of barren country from the next open fresh water. Are they the remains of the fish that populated the rivers which, like the Wadi Sahba, once flowed over Arabia, and have they been driven by the drying up of the country nearer and nearer to the source, or have they been brought by some other agency? If so, the theory that fish are colonised by being carried as eggs on the breasts and feet of wild-fowl comes up for discussion.¹ Nature seldom provides such a precarious means of transport for the distribution of its species as this sounds. If the eggs were laid in hard indigestible cases and were swallowed by the bird, a system already adopted by parasitic insects, this would be more readily acceptable as a solution of the problem.

The specimens have all been presented to the British Museum.

Two instances of fish living in hot or tepid springs may be of interest, although in neither case has the species been identified.

Doughty speaks of little silver-green fishes in tepid springs savouring of sulphur in Kkeybar oasis (*Arabia Deserta*, Vol. II. p. 188) and also in the Peræa (Vol. I. p. 27), and Sir Arnold

¹ I have been unable to find any proof that competent observers have seen eggs of fishes carried in this way, although such evidence may exist.

Wilson has drawn my attention to the *Reminiscences* of Professor A. H. Sayce, who, writing of Algeria, says (p. 249): "A few days later we were at Hammam Meskoutin, where the sulphurous hot springs cover the limestone plateau with miniature volcanoes of cone-like shape. In one place the hot water falls over the edge of a cliff into the stream below, turning the face of the cliff into lands of red, pink, and yellow, like the famous "terraces" of New Zealand. Still boiling, the water pours itself into the stream and, although it scalds the hands, if put into it, ghostly-looking fish, white and semi-transparent, are seen swimming in it whose ancestors migrated from the cold water beyond and were gradually acclimatised to the conditions of a torrid zone." Although this indicates that fish were living in the scalding water I should think that, had the temperature been taken where the fish actually were, it would have been found that the waters had cooled considerably between that part and the scalding basin. An interesting experiment for those who have facilities would be to ascertain, by gradually raising the temperature of the water, what is the limit of heat that *Cyprinodon dispar* is able to withstand, and whether successful resistance to high temperatures is accompanied by any physical specialisation.

APPENDIX V

INSECTS

THE Collection of Insects was handed over to Major E. E. Austen, of the British Museum (Natural History), who kindly undertook the distribution of the various groups, and the identification was made by the following specialists of the Staff.

<i>Lepidoptera</i> (<i>Rhopalocera</i>)	.	Mr. N. D. Riley.
„ (<i>Heterocera</i>)	.	Mr. W. H. T. Tams.
<i>Coleoptera</i>	.	Mr. K. G. Blair, B.Sc.
<i>Hymenoptera</i>	.	Dr. J. Waterston, B.D.
<i>Diptera</i>	.	Major E. E. Austen, D.S.O., and Mr. F. W. Edwards, B.A.
<i>Hemiptera</i>	.	Mr. W. E. China, B.A.
<i>Odonata</i>	.	Mr. K. G. Blair, B.Sc.
<i>Orthoptera</i>	.	Dr. B. Uvarov.

In addition to these a large hairy Spider (*Terrimundalum*) secured at Jabrin has proved to be *Galeodes arabs*.

A small green larva with white line down the back, which appeared to be that of a Saw-fly, was devastating large areas of lucerne in Hufuf on January 19, 1924. Lady-birds were present in numbers and were feeding on the pest, but made no impression. The only measure being taken was to dig up and resow the infected areas.

A White Ant was seen on sand-dunes in the Jafura Desert, and Black Ants were noted in several localities between Hasa and Jabrin.

Doughty, in *Arabia Deserta* (Vol. II. p. 199), mentions azure, dun and vermilion Dragon-flies seen at Kheybar oasis. This description would indicate the three species seen by me at Hasa.—R. E. C.

LIST OF INSECTS COLLECTED BY MAJOR R. E. CHEESMAN IN ARABIA

With the exception of the *Lepidoptera* this list contains little that is new or of special interest. The beetles, grasshoppers,

etc., are all such as from their known distribution might have been expected to occur in the districts visited, while the rare and interesting species that might have been anticipated from a part of Arabia so little worked are disappointingly absent.

The Lepidoptera, however, are more interesting; two essentially Palæarctic butterflies, *Papilio machaon* and *Colias crocea*, not having previously been recorded from as far south, while for *P. demoleus* the capture marks an eastward extension of its range. The most noteworthy of the butterflies is undoubtedly a new local race, now named after its discoverer, of *Precis orithya* L. Sixteen specimens of moths contain nine species, of which four are new. Of these *Cossus cheesmani* and *Trichoclea avempacei* are quite unlike anything known from the area which extends from North Africa through Syria and Persia to Afghanistan. The other species are akin to forms known from this area.

COLEOPTERA (Beetles)

GYRINIDÆ (Whirligig Beetles)

Dineutes æreus Klug. From Lahej, Muscat, Aden, Socotra and tropical Africa to Natal. Hufuf, 14. xii. 23.

Dineutes sp. ? Hufuf, 14. xii. 23.

COCCINELLIDÆ (Lady-birds)

Coccinella 7-punctata L. Europe, Asia and part Africa. Hufuf, 29. xi. 23.

TENEBRIONIDÆ (Darkling Beetles)

Tentyria giraffa All. Arabia, Sinai. Hufuf, 1. xii. 23.

Adesmia clathrata Sol. Persia, Mesopotamia. Hufuf, 1. xii. 23.

Akis subtricostata Redt. Persia, Mesopotamia, Arabia. Hufuf, 1. xii. 23.

Pimelia arabica Klug. Egypt, Arabia, Hejaz, Hadhramaut. Hasa.

SCARABÆIDÆ (Sacred Beetles)

Scarabæus compressicornis Klug. Egypt, Abyssinia, Arabia, Persia, Karachi. Jabrin.

MELOLONTHIDÆ (Chafers)

Tanyproctus sp. ? (badly broken). Jabrin, 22. ii. 24.

HYMENOPTERA (Bees, Wasps, etc.)

- Cryptocheilus flavus* Fabr. (a species of Hunting Wasp). Hufuf, 29. xi. 23.
Campoplex (*sens. lat.*) sp. ? (a species of Ichneumon). Hufuf, 14. xii. 23.

LEPIDOPTERA RHOPALOCERA (Butterflies)

- Papilio machaon* L. (the Swallow-tail). Hufuf, 20. xi. 23.
 „ *demoleus* L. (the Lime Butterfly). Hufuf, 20. xi. 23.
Colias crocea Fourc. (syn. *C. edusa*) (the Clouded Yellow). Hufuf, 20. xi. 23.
Lampides bœticus L. (Long-tailed Blue). Hufuf, 20. xi. 23.
Zizera lysimon Hb. Hufuf, 20. xi. 23.
Precis orithya Linn. (new subspecies, *cheesmani*, Riley). Hufuf, 20. xi. 23.

LEPIDOPTERA HETEROCERA (Moths)

NOCTUIDÆ

- Agrotis subspinigera* Hampson. Hufuf, 1. xii. 23.
Agrotis saracenica Tams (new species). Jabrin, 21. ii. 24.
Trichoclea avempacei Tams (new species). Hufuf, 23. i. 24.
Callistege albifusa de Joannis. Hufuf, 29. xi. 23.

COSSIDÆ

- Cossus cheesmani* Tams (new species). Jabrin, 23. ii. 24.

PYRALIDÆ

- Heterographis fulvimarginella* Hampson. Jafura, 26. ii. 24.
Cornifrons ulceratalis Lederer. Hufuf, 29. ii. 24.
Tegostoma confluentalis Hampson. Jafura, sand-dunes, 26. ii. 24.
Noctuella avicennæ Tams (new species). Jafura, sand-dunes, 26. ii. 24.

DIPTERA (Two-winged Flies)

CULICIDÆ

- Culex fatigans* W. (common household Mosquito of the Tropics). Hufuf, 12. xii. 23.

MUSCIDÆ

Stomoxys calcitrans L. (Stable Fly). Persian Gulf, Kuwait, 31. iii. 24. (caught on board s.s. *Frankenfels*).

HEMIPTERA (Bugs)

Hydrocyrius columbiæ Spin. (Giant Water Bug. A male with 90 eggs forcibly fixed on his back by female.) Trop. Africa, Madagascar, etc. Hufuf, 24. xii. 23.

ODONATA (Dragon-flies)

Orthetrum sabina Drury. Arabia to Australia and the Pacific Islands. Hufuf, 15. xii. 23.

Trithreria annulata Beauv. Africa. Hufuf, 15. xii. 23.

Philonomon luminans Karsch (?). Hufuf, 15. xii. 23.

ORTHOPTERA (Grasshoppers, Locusts, etc.)

MANTIDÆ

Hypsicorypha gracilis Burm. N. Africa (Canary Islands to Egypt.) Jabrin, 21. ii. 24.

ACRIDIDÆ

Acridella nasuta L. S. Palæarctic. Jabrin, 1. iii. 24.

Catantops saucius Burm. Cape Verd Islands to Egypt, Seychelles (abundant). Hufuf, 14. xii. 23.

Acrotylus insubricus Scop. S. Palæarctic (very common). Hufuf, 14. xii. 23.

(From the *Annals and Magazine of Natural History*, Ser. 9, Vol. XV. p. 151, January, 1925.)

List of the Butterflies collected in Arabia by Captain R. E. Cheesman, with a Description of One new Subspecies. By N. D. RILEY.

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NYMPHALIDÆ

Precis orithya cheesmani, subsp. n. (Plate 66, 5, 6.)

♂ ♀. Nearest to *P. orithya here* Lang,¹ but the white post-discal band of the fore wing above entirely suffused with blue—

¹ *Entom.* xvii. p. 207 (1884).

i.e. the ocellus in area 2 is completely surrounded (but not so strongly on its outer side) by blue, which extends thence to the costa; the costa of fore wing and the marginal areas of both wings, but especially of the hind wing, darker than in *here*. Underside like that of *here*, but much less ochreous, almost pale sooty-grey in general tone, especially the tornal area.

Hufuf, 20. xii. 23, 1 ♀; 29. xi. 23, 3 ♂, 2 ♀.

B.M. type no. Rh. 241 ♂, 242 ♀; co-types, 243, 244 ♂, 245, 246 ♀.

Very little variation is visible in the three males; the three females, on the other hand, exhibit a good deal. One specimen has the white fore-wing band hardly at all suffused with blue. The underside of this specimen is like that of the males. In the other two females the underside is of the drier type. In one of them it is almost uniform purplish-grey; the other is intermediate.

Precis here was originally described from specimens in the B.M. from Aden and Mesopotamia. The occurrence of this most distinct race in a locality almost exactly intermediate between these two places seems to indicate a degree of isolation in the fauna of Hufuf which would hardly have been suspected.

PAPILIONIDÆ

Papilio machaon L.

Hufuf, 1 ♂, 20. xi. 23; 1 ♂, 24. xii. 23.

Papilio demoleus L.

Hufuf, 2 ♂, 1 ♀, 20. xi. 23.

The occurrence of *Papilio machaon*, an essentially Palæarctic species, in this locality is a little unexpected. It is, of course, well known from Syria, Palestine, and Mesopotamia; but Hufuf is considerably removed geographically, if not so well separated faunistically, from all these countries. *Papilio demoleus*, on the other hand, was more likely to be met with. Its occurrence, however, considerably extends its known range, the nearest localities from which it had previously been recorded being Persia and Muscat, the latter in the extreme north-east of Arabia.

PIERIDÆ

Colias crocea Fourc.

Hufuf, 1 ♂, 20. xi. 23.

The same remarks apply to this species as to *Papilio machaon*.

LYCÆNIDÆ

Zizera lysimon Hb.

Hufuf, 2 ♂, 20. xi. 23; 1 ♂, 1 ♀, 29. xi. 23.

Lampides bœticus L.

Hufuf, 1 ♂, 29. xi. 23.

Both these "Blues" were to be expected. Both have a very wide distribution throughout the southern Palæarctic and the Indo-Australian regions.

(From the *Annals and Magazine of Natural History*,
Ser. 9, Vol. XV. p. 144, January, 1925.)

List of the Moths collected in Arabia by Captain R. E. Cheesman, with Descriptions of Four new Species. By W. H. T. TAMS.

(Published by permission of the Trustees of the British Museum.)

All the species, as might be expected, exhibit the colour-characteristics peculiar to African desert-moths. Four new species in such a small number of specimens from three widely separated localities is a remarkably high percentage, and it may reasonably be expected that further collecting in these regions will produce much interesting desert material. In spite of the smallness of the collection, it contains species occurring in or closely related to species from Egypt, Persia, and N.W. India.

NOCTUIDÆ

AGROTINÆ

Agrotis subspinifera Hmspn.

Agrotis subspinifera Hampson, *Cat. Lep. Phal. B.M.* iv. p. 205, pl. lxi. fig. 19 (1903).

1 ♀, Hufuf, 1. xii. 23. The ♂ type and another ♂ came from Ferozepore, Punjab, Oct. 1897 (*Nurse*).

Agrotis saracenica sp. n. (Plate 66, 1.)

♂. Facies of *Agrotis hodnæ* Oberthür, but darker in colour. Antennæ serrate-fasciculate, the shaft above with buff scales mixed with some hair-brown scales. Frons in structure like that of *Agrotis segetum* Schiff., but with the apex of the prominence pear-shaped in outline, the narrow end uppermost. Palpi cream-buff, the basal and second segments shaded on the outer side with fuscous. Head and thorax drab, white and

sepia mixed, many of the darker scales white-tipped; tegulæ whiter than rest of thorax. Pectus cartridge-buff. Abdomen above and beneath cartridge-buff, irrorated with drab. Legs cream-buff, the tibiæ with a few drab or hair-brown scales, the tarsi with the larger part of each segment sepia, the tips only being cream-buff. Fore wing ground-colour drab, the veins and pattern fuscous-black, with white splashings on each side of the veins and in and above the orbicular. Claviform marking outlined with fuscous-black, extending along the anal fold to a point opposite to the junction of vein *Cu* 2 with the cell. Orbicular elongate, but not confluent with the reniform; finely outlined with fuscous-black, with a central patch of drab scales surrounded by white and cream-buff scales; reniform large, filling the end of the cell, heavily outlined with fuscous-black and almost filled with fuscous-black; a heavy fuscous-black shade on the costa above the reniform; an obscure fuscous-black band from reniform to inner margin, slightly converging towards termen; a subterminal row of six interneural fuscous-black arrow-head dashes below vein *M* 1, the dash above the anal vein being less well-defined than the others; a patch of fuscous-black shading between veins *M* 1 and *M* 2, from the arrow-head dashes to termen; terminal line thickened interneurally, black; fringe fuscous, with a cream-buff line at base. Ground-colour modified above, in and beyond end of cell, by an admixture of cream-buff scales. Hind wing white, with a fine fuscous terminal line, thickened interneurally; fringe white. Underside almost entirely white; fore wing with costa irrorated with fuscous and fuscous-black; a curved fuscous dash across end of cell; a curved fuscous shade from costa to vein *R* 5 postmedially; a diffuse drab subterminal shade, broader and darker at costa, parallel with termen; terminal line fine, fuscous-black, thickened interneurally; hind wing white, faintly irrorated with drab on the costa, a few fuscous scales above the middle of the discocellulars.

Expanse 40 mm.

Holotype ♂, Jabrin, 200 miles S.S.W. of Hufuf, 21. ii. 24.

HADENINÆ

Trichoclea avempacei Tams, sp. n. (Plate 66, 3.)

♂. Palpi cartridge-buff, sparsely irrorated with fuscous-black. Antennæ bearing bristles and cilia; bristles at middle of antennæ slightly longer than diameter of shaft, length of cilia about two-

thirds of length of bristles; upper side of shaft cartridge-buff. Frons prominent, rounded, transversely rugose; clothed with cartridge-buff scales, with a transverse band of fuscous shading at the middle. Vertex of head cartridge-buff, irrorated with fuscous-black. Thorax whitish mixed with cartridge-buff, irrorated with fuscous-black. Pectus cartridge-buff. Abdomen above and beneath cartridge-buff, irrorated with fuscous. Legs cartridge-buff irrorated with fuscous-black, fore tarsi with a narrow band of fuscous-black on the middle of the first two segments, the other three segments fuscous-black above; mid-tarsi with the second segments heavily shaded with fuscous-black on the proximal two-thirds, the last three segments almost entirely fuscous-black above; hind tarsi with the third segment shaded with fuscous-black on proximal two-thirds, the fourth and fifth fuscous-black above. Fore wing whitish, tinged with cartridge-buff along the costa, in and beyond the cell, along the lower edge of the cell to the termen, and along the middle of the inner margin, these cartridge-buff-tinged areas sparsely irrorated with clay-coloured scales; the cell-margins irrorated with black and fuscous scales; veins from the cell black, except near the cell; veins *Sc*, *R* 1, and *R* 2 bearing black scales towards their junction with the costa; reniform large, black-outlined except towards the costa, where it is open, filled with an inner reniform patch of fuscous, fuscous-black, and white scales, separated from the black outline by a cartridge-buff-tinged whitish ring; orbicular black-outlined, oval, touching reniform, open basad, containing a patch of grey and drab surrounded by white, the black outline on the lower side continued as a wavy line for a distance slightly greater than the length of the orbicular, with, after a short break, a fuscous line to the wing-base; a broad black streak from wing-base to the lanceolate claviform, which is long, outlined with black, and partially filled with a long narrow patch of fuscous mixed with whitish; a fine black line from apex of claviform along anal fold to termen. A short black dash along the anal vein near the base, another near the termen; a fuscous-irrorated drab patch, in area equal to the reniform, which it adjoins, lying between veins *M* 2 and *Cu* 1; a diffuse greyish shade between veins *R* 4 and *R* 5, not filling the whole interspace; six terminal interneural fuscous-edged black striæ between *R* 5 and the anal vein (*A* 2), the two middle striæ, lying between *M* 2-*M* 3 and *M* 3-*Cu* 1, being the longest, and running into the fuscous-irrorated drab patch adjoining the reniform; fringe alternately

cartridge-buff and fuscous-black, the latter interneurally. Hind wing cartridge-buff, suffused with fuscous, lighter at base, becoming darker towards termen; a fuscous dot at middle of discocellulars; fringe cartridge-buff with a few fuscous scales. Underside of fore wing cartridge-buff, irrorated with fuscous-black and black, beyond and below the cell suffused with light brownish-drab irrorated with whitish; a large fuscous-black reniform stigma at end of cell; fringe as on upperside, except for the fuscous-black interneural streaks, which have the basal half cartridge-buff. Underside of hind wing cartridge-buff irrorated with black, the veins towards the termen and the termen itself accentuated with black; fringe cartridge-buff, with a few fuscous scales.

Expanse 29 mm.

Holotype ♂, Hufuf, 23. i. 24.

CATOCALINÆ

Callistege albifusa de Joannis.

Callistege albifusa de Joannis, *Bull. Soc. ent. Egypt.* 1909, p. 165.

1 ♀, Hufuf, 29. xi. 23.

COSSIDÆ

Cossus cheesmani Tams, sp. n. (Plate 66, 2.)

♂. Palpi cartridge-buff, outwardly shaded with fuscous. Shaft and pectinations of antennæ lightly covered with white scales, barely hiding the olive-brown colour of the chitin beneath. Head, thorax, and abdomen, dorsally and ventrally, cartridge-buff. Legs cartridge-buff; fore femora shaded above with drab, fore tibiæ with three indistinct bands of fuscous irroration—two in the proximal third, the other marking off the distal third; each fore tarsal segment ringed at the middle with olive-brown; mid and hind legs with only the faintest traces of rings on the tarsal segments. Fore wing white, suffused with maize-yellow between costa and upper margin of cell, between end of cell and termen, and, with the exception of a white strip along the anal vein (*A* 2), between the lower margin of the cell (up to vein *Cu* 2) and the inner margin of the wing; markings striate rather than reticulate; clove-brown striæ along the costa, in the end of the cell, and below the cell in the basal third of the wing; remainder of striæ olive-brown; basal half of cell and patches between the postmedial and subterminal striæ and below end of

cell not striate; a terminal series of olive-brown spots at the vein-ends, increasing in size from apex of wing to anal vein; fringe white, marked at the veins with faint traces of drab. Hind wing white, the veins but lightly covered with scales; faint traces of striation in the cubital and anal areas; faint olive-brown spots on termen at veins, with traces on fringe. Under-side cartridge-buff; fore wing with costal and subterminal striæ evident; hind wing with traces of striæ on costa and in cubital and anal areas.

Expanse 48 mm.

Paratype ♂. Paler in colour of markings; striæ buffy brown to ochraceous-buff, more reticulated and more evenly distributed over fore wing.

Holotype ♂ and paratype ♂, Jabrin, 200 miles S.S.W. of Hufuf, 23. ii. 24.

This species resembles *Cossus ægyptiaca* Hmps., but differs from it in the following features:—Both fore and hind wings are longer and narrower, markings lighter and showing less reticulation, hind wings almost free from markings, and under-side with few striæ.

The description of *Cossus ægyptiaca* Hmps. is most misleading, as it was made from a specimen which had become badly greased. This specimen has been cleaned for comparison with the species here described; but as this is not a suitable opportunity for the redescription of an Egyptian moth, I propose to leave that until I have material sufficiently good to make a satisfactory description possible.

PYRALIDÆ

PHYCITINÆ.

Heterographis fulvimarginella Hmps.

Heterographis fulvimarginella Hmps., *J. Bomb. Nat. Hist. Soc.* xv. p. 23 (1903).

1 ♂, 3 ♀♀, Jafura sand-dunes, 26. ii. 24.

These moths occurred in such numbers that they extinguished Captain Cheesman's lamp.

PYRAUSTINÆ.

Cornifrons ulceratalis Led.

Cornifrons ulceratalis Led., *Wein. ent. Monat.* ii. p. 147, pl. iv. fig. 1 (1858).

1 ♂, 2 ♀♀, Hufuf, 29. ii. 24.

Tegostoma confluentalis Hmps. n.

Tegostoma confluentalis Hmps. n., *Ann. & Mag. Nat. Hist.* (8) xii. p. 299 (1913).

1 ♂, 1 ♀, Jafura sand-dunes, 26. ii. 24.

Noctuella avicennæ Tams, sp. n. (Plate 66, 4.)

♂. Palpi, scaling of antennal shaft, head and thorax tawny-olive. Abdomen olive-buff. Pectus and underside of abdomen drab-grey to pale drab-grey or dirty whitish. Legs tawny-olive above, whitish beneath. Fore wing drab mixed with warm buff, producing a general tawny-olive effect; a fuscous-black medial line, commencing as an acute-angled V (on its side, apex basad), with the tip of its upper arm in the upper angle of the cell and the tip of its lower arm in the lower angle, whence the line takes a sharply oblique slightly curved course basad, enclosing in the angle thus formed a pointed white patch, which merges into the ground-colour basad; an oblique fuscous-black postmedial line, forming three dentations (points terminad) above vein *M* 1, below which it curves basad (convexity terminad) to vein *Cu* 2, turning and diverging slightly from the medial till it reaches vein *A* 2, where it turns sharply terminad, curves round and runs into the inner margin at right angles; the whole line accentuated on the basad side with white, most strongly from the costa to vein *Cu* 2; an indefinite subterminal line from the apex diverging slightly from the termen, becoming lost in a whitish patch at the tornus; between the postmedial and the subterminal a drab shade; a fuscous terminal edging preceded by white; fringe with a row of short fuscous-tipped buff scales, and a row of long white scales mixed with fuscous scales at the ends of the veins. Hind wing light olive-buff with fuscous shading deepening towards the termen; a distinct fuscous subterminal shade, accentuated with fuscous-black at vein *Cu* 2, preceded at this point by a dash of white, and followed by a patch of tawny-olive with a dash of white before the fuscous terminal edging; fringe as in fore wing, but fuscous scales at vein *Cu* 2 only. Underside pale olive-buff; traces of upper-side pattern; fore wing with traces of tawny-olive along costa, cartridge-buff between cell and inner margin and also between the oblique lines; cell and subterminal area shaded with drab; a series of whitish dashes on the veins and between them, before the termen; fringe much as on upperside; hind wing with costal margin suffused with cream-buff; traces of fuscous postmedial line; termen and fringe as on upperside.

Expanse 22 mm.

- Holotype ♂, Jafura sand-dunes, 26. ii. 24.

N. avicennæ is very nearly related to *N. albidalis* Hmps., which was described from a somewhat worn female from Fao. The two are alike in size, but the Fao female, which is very pale and seems to have lost many of its markings, may be a faded specimen. The scheme of the pattern resembles that of *N. desertalis* Hübn., which is, however, a larger moth.

I have named the *Cossus* in honour of Captain Cheesman, who made this collection. The *Trichoclea* I have called after Avempace, a Moslem philosopher who was born at Saragossa and who died at Fez in 1138. The *Noctuelia* I have named after Avicenna, who was famous among the Moslems as a physician and philosopher, who translated the works of Aristotle and influenced scientific thought in Europe during the eleventh century.

APPENDIX VI

BOTANICAL NOTES

Botanical Notes. By R. D'O. GOOD and C. NORMAN.

THE botanical collection made by Major Cheesman in Hasa, Jafura, and Jabrin, Eastern and Central Arabia, which has been presented by him to the Herbarium of the British Museum, consists of 35 species, 13 being cultivated plants, the remaining 22 indigenous. Of these latter 14 are Dicotyledons, 6 are Monocotyledons. The remaining two are Ferns. One of these is the well-known and almost cosmopolitan Maiden-hair Fern (*Adiantum capillus-Veneris* L.). The other is *Ceratopteris thalictroides* Brongn., a most remarkable plant with a very anomalous structure. It is the only representative of its family and is especially interesting because it grows totally submerged in still or slowly-running water. Its distribution is pan-tropical and it also extends into the sub-tropics. Major Cheesman's specimens were found in the hot springs of Hufuf, where the water is permanently at a temperature of just under 90° F. I can find no other records of this plant from such a habitat, and its ability to maintain itself and to multiply vigorously under such conditions is very remarkable. The Hufuf specimens bear no sporangia, but many of the thalli have given rise to vegetative buds along the margins.

The Phanerogams fall under two heads, namely, widespread desert or saline types and occasional more hygrophilous plants occurring in the oases. Among the latter is *Orchis palustris*, a plant widely spread in Europe. It also occurs in North Africa and the Orient, but does not seem to have been recorded from Arabia. The ubiquitous Common Reed (*Phragmites*) is also a feature of these spots. *Acacia flava* is one of the few trees.

The characteristically desert plants comprise twelve species—all Dicotyledons. The most conspicuous family is the *Chenopodiaceæ* with three species. The *Compositæ*, on the other hand, are represented by only one species, but economically this is

one of the most important plants of the deserts. There are also two interesting parasitic plants. *Phelipæa lutea* (closely related to our native Broom-rapes) lives upon *Chenopodiaceæ*, etc. *Cynomorium coccineum*, one of the *Balanophoreæ*, also exploits the same hosts, and the two parasites are often to be found growing close together and living under precisely similar conditions, although entirely unrelated. *Calotropis procera*, a widespread *Asclepiad*, is perhaps the most luxuriant plant of the desert flora.

These twelve desert species all have a distribution in a latitudinal direction through various distances over the chain of deserts stretching from N.W. Africa to W. India. *Calotropis procera* covers nearly the whole distance and also extends down into tropical Africa. *Rhanterium epapposum* also ranges from N. Africa to Baluchistan. *Phelipæa* has a similar distribution, reaching to Spain in the N.W. In general the remaining species may be divided according to the parts of the desert chain which they occupy. Three species are found in the Central portion; two are found in the Eastern half and four in the Western half. This distribution in a latitudinal direction is but what might be expected from the situation of the deserts and saline lands. At the same time it is of interest in connection with the presence of a marked African-Indian element in the flora of tropical Africa—an element which does not comprise an undue proportion of xerophilous forms.

The following is a list of the plants collected, together with the collector's notes.—R. D'O. G.

INDIGENOUS AND CULTIVATED PLANTS

INDIGENOUS PLANTS

PHANEROGAMS

RESEDACEÆ

1. *Ochradenus baccatus* Del. "Gurdhī." Jafura Desert, in flower February 14. A mignonette in stools, 2 feet high, greedily eaten by camels. Rare. *Dist.*—Egypt, Persia, Sind.

ZYGOPHYLLACEÆ

2. *Zygophyllum album* L. "Hamdh" or "Rimdh." Hasa and Jabrin. A fleshy-leaved bush, 2 feet high, on raised mounds of drift sand. Eaten by camels, but not suitable

for waterless marches as it makes them thirsty. *Dist.*—Canaries, N. Africa, Syria, Asia Minor.

LEGUMINOSÆ

3. *Alhagi Maurorum* Desv. "Shok Shibram." Jabrin. A straggling, thorny plant, 1 foot high, called "Aqul" in Iraq. Eaten by camels. *Dist.*—N. Africa, Syria.
4. *Acacia flava* Schweinf. "Salam." Hasa and Jabrin. Acacia trees, 20 feet high (Plate 53). Grows in depressions and dry Wadi beds. Eaten by camels in spite of long thorns. *Dist.*—Arabia, Persia.

COMPOSITÆ

5. *Rhanterium epapposum* Oliv. "Arfaj." Hasa and Jabrin. Bush, 2 feet high (Plate 30). The commonest plant on gravel plains; in flower January 12 to March 1. Eaten by camels. *Dist.*—N. Africa, Arabia, Beluchistan.

PLUMBAGINÆ

6. *Statice axillaris* Forsk. Oqair. Stools 6 inches, like Sea Lavender in flower spike. In flower March, 1921. *Dist.*—Egypt, Somaliland and Arabia.

APOCYNACEÆ

7. *Rhazya stricta* Decn. "Hamal." Jafura. Shrub, 2 feet; leaf and growth resembles Azalea in distance, flower minute. In flower February 16. Camels will not touch it. *Dist.*—Arabia, Afghanistan, Sind.

ASCLEPIADACEÆ

8. *Calotropis procera* R.Br. "Ashurr." Umm al Dharr. In dune country between Oqair and Hufuf. Shrub, 10 feet; thick milky juice flows when broken (Plate 12). Large, green kidney-shaped fruit, bark thick cork. In flower November. *Dist.*—N. Africa, Arabia, Persia, Sind, Punjab, Ceylon.

CONVOLVULACEÆ

9. *Convolvulus* sp. nr. *lanatus*. Salwa. 6 inches high, large purplish petals. In flower March, 1921.

OROBANCHACEÆ

10. *Phelipæa lutea* Desf. "Dhanun." Hasa. Yellow flower spike like a Broom-rape, 1½ feet (Plate 11). In flower

- January 2 to March 1. Plentiful. Thick, succulent, underground stem. Parasitic on plant roots in soft sand. Eaten by camels. *Dist.*—Spain, N. Africa to India.

CHENOPODIACEÆ

11. *Arthrocnemon fruticosum* Moq. "Gadha." Jabrin. Bushes, 4 feet on soft sand-hills, salt bush group (Plate 57). Eaten by camels. *Dist.*—America, Europe, N. Africa, Arabia.
12. *Suaeda vermiculata* Forsk. "Sawad." Jabrin. Bush, 3 feet high, salt bush group (Plate 50). Fleshy leaves vary from yellow to dark purple. Eaten by camels. *Dist.*—Canary, N. Africa, Egypt, Arabia.
13. *Seidlitzia Rosmarinus* Bunge. "Shinan." S. Jabrin. Bush, 3 to 5 feet, salt bush group (Plate 49). Fleshy leaves paler than "Sawad." Eaten by camels. *Dist.*—Egypt, Arabia.

POLYGONACEÆ

14. *Calligonum comosum* L'Herit. "Aabel." Hasa and Jabrin. Bushes, straggling, up to 8 feet. Plentiful in sand-dunes (Plate 35). Male flowers pink or yellow fluffy balls; female flowers, small, usually on separate branch. In flower February. Eaten by camels. *Dist.*—N. Africa, Arabia, Persia.

BALANOPHOREÆ

15. *Cynomorium coccineum* L. "Tarthuth." Hasa deserts. A dark red flower spike, $1\frac{1}{2}$ feet, flowers minute (Plate 11). Large, succulent underground stem eaten by badawin and sold in markets, where townspeople walk about gnawing them. Parasitic on plant roots in soft sand. In flower February and March. *Dist.*—Mid. region and C. Asia.

ORCHIDACEÆ

16. *Orchis palustris* Willd. Umm al Saba, Hufuf. Flower spike $1\frac{1}{2}$ feet, petals pale puce, leaves green and unspotted, several specimens growing in marshy land among thick rushes. In flower January 28. Faint, sweet smell. Finding an Orchis similar in some ways to the Purple Orchis of England, in a desert oasis, was one of the surprises of the expedition. *Dist.*—Continental Europe, N. Africa, Orient.

JUNCACEÆ

17. *Juncus acutus* L. Hufuf oasis. 4 feet. The wiry leaves of this rush have a sharp spike at the point and it is very painful to walk about in them. *Dist.*—Temperate regions.

CYPERACEÆ

18. *Fimbristylis*, cf. *ferruginea* Vahl. Hufuf oasis. 4 feet. In flower January 2. Like the last, this rush grows round rice-fields and along streams. Leaves are very sharp at point and are used in the manufacture of reed matting. *Dist.*—A widespread species.

GRAMINEÆ

19. *Dactyloctenium aegyptiacum* Willd. Hufuf oasis. A grass, low growing, found along water channels and damp places near cultivation. Flower spike like bird's foot with but three toes.
20. *Phragmites communis* L. Hufuf oasis. 7 to 8 feet. In seed January 2. Reed growing in flooded areas and on rice lands; is cut, harvested and used extensively for reed matting for floors, made by women and seen in most houses. The fine stems are used without splitting and make a neat, closely woven mat which is sold in long strips in the markets.

CRYPTOGAMS

21. *Adiantum capillus-Veneris* L. Hufuf oasis. Maiden-hair Fern growing along damp banks of water channels and in masonry of bridges.
22. *Ceratopteris thalictroides* Brongn. Umm al Khorasan spring, Hufuf oasis. A bright green Water Fern, the only known representative of its family. Plants were entirely submerged in warm water of the spring. Has two distinct shapes of leaf, one a much-lacerated outline. On the edges of leaves complete young plants were formed.

Two kinds of *Acacia* were seen, for which the Arab names are "Salam" and "Aqul." Both are trees, and they appear in the photographs, but no specimens of *Aqul* were brought home. The *Aqul* of Jabrin is not the small thorny scrub called *Aqul* in Iraq.

CULTIVATED PLANTS

LEGUMINOSÆ

23. *Cajanus indicus* Spreng. Hufuf. In bloom November 20. A yellow-flowered, Vetch-like plant, not plentiful in November. Cultivated throughout Tropics.

LYTHRACEÆ

24. *Lawsonia alba* Lam. "Henna." Hufuf. Not in flower November 11. A row of the bushes, 5 feet, and looking like Privet, can be seen in most gardens. The stems and leaves are dried, pounded and made into a fine paste with acid and smeared on finger- and toe-nails; when dry it is removed and leaves a permanent brown stain; nails coloured thus are considered the acme of refinement. Many white donkeys are disfigured with red designs made with Henna by way of ornament. It is also believed to harden the skin and prevent saddle galls. The Persian custom of staining the hair and beard red with Henna is not in favour in Arabia.

UMBELLIFERÆ

25. *Anethum graveolens* L. "Halwa." Hufuf. In flower November. English, Aniseed; umbels of small yellow flowers; 2 feet. Grown in most gardens; much in favour for flavouring. The famous Hasa dates, called Khelas, are often sprinkled with the seed and then packed.

SALVADORACEÆ

26. *Salvadora persica* L. "Raka." Abu Zahmul, Oqair. A large, thick clump of bushes, 4 to 5 feet high, growing in ruin-field. Sticks are cut from it for polishing teeth. As this was the only locality this plant was seen in, I have assumed it was once cultivated there. Philby reports it from Wadi Dawasir. *Dist.*—Tropical N. Africa, Arabia, Persia, Sind, Ceylon.

SOLANACEÆ

27. *Withania somnifera* Dun. Hufuf gardens. In flower November 28. 3 feet. Probably used medicinally. *Dist.*—Mediterranean, Trop. S. Africa, Arabia, Persia, India.

LABIATÆ

28. *Ocimum basilicum* L. Hufuf gardens. Height 2 feet, in flower November 25. A Thyme-like plant with similar smell; said to be grown because the women-folk like it.

NYCTAGINEÆ

29. *Mirabilis jalapa* L. Hufuf gardens. In flower November 28. Small, crimson, trumpet-shaped flower.

AMARANTHACEÆ

30. *Digera arvensis* Forsk. Hufuf. A low, insignificant plant, probably a weed among cultivation. *Dist.*—Tropical Africa to India.

GRAMINEÆ

31. *Phalaris minor* Retz. "Reshadi." Hufuf corn-fields. In flower February 3. The plant called Canary Seed, growing possibly as a weed among irrigated wheat. It was being picked out and given as green fodder to animals. *Dist.*—Greece, Orient, S. Africa.
32. *Triticum durum* Steud. See *T. vulgare*.
33. *Triticum vulgare* Vill. Hufuf. Strong, healthy, dark green straw, 3 feet 6 inches high. Wheat sowing was general at the end of November, and it was coming into ear February 3. Several fields of bearded Wheat of above two varieties were seen in the Hasa oasis, but the area under Wheat is not great, although this is the only winter corn grown. Barley is not grown. I searched the oasis diligently. I found only one instance of Barley sown in tufts round a small Lucerne patch. Wheat is sometimes sown on rice-fields which are dried off between rice crops.

Commercial Samples of local-grown Wheats from the Hufuf Bazaar

- (1) *Triticum vulgare* : Arabic "Saidiya." A good even example of a well-grown hard Wheat : considered the best and highest priced in the market.
- (2) 2nd Grade : Arabic "Kodla." *Triticum durum* and *Triticum vulgare* mixed, and contains 9 per cent. of thin, small-grained Barley. This fetches a lower price than No. (1).

34. *Pennisetum dichotomum* Del. A little foxtail Millet, 3 feet, grown in stools round Lucerne patches.
35. *Oryza sativa* L. Hufuf oasis. Rice was being cut and harvested November 23. It is not considered of very good quality and is eaten by the peasants. The best rice is imported from India. Large areas on low-lying ground at the tail-end of canals are paddy fields, date palms growing round the high, enclosing banks.
36. *Cordia Myxa* L. var. Tree, 20 feet high.

I also saw in the Hufuf oasis specimens of Indian trees such as the Indian Almond (*Terminalia Catappa* L.), the "Persian Lilac" (*Melia Azedarach* L.) and Castor Oil plant (*Ricinus communis* L.) growing as ornamental trees in rich men's gardens; also some common Willow Trees (*Salix*). The tall, graceful Tamarisk (*Tamarix macrocarpa*)—Arabic "Ithl"—40 feet in height, grows all over the oases of Hasa and Jabrin; the timber is used for building, is cut into planks for doors, and in Riyadh is made into bowls used by badawin for milk.

Also *Zizyphus Spina-Christi* Willd.—Arabic "Sidra" or "Nebuk"—big trees, 30 feet. It is planted by water lifts, where its spreading branches and thick leaves give shade to man and beast working on the pulleys. The dry, plum-like fruit is eaten. The various kinds of Dates grown in Hufuf are mentioned in a previous chapter.

Orange, Lemon and Citron trees and Pomegranate bushes flourish and are plentiful; Mulberry trees are not quite so numerous.

Vegetables seen.—Onions, transplanting seedlings November 20; a Spinach (Arabic "Silli"), really a kind of Wurzel; Brinjal or Egg-plant (Arabic "Betinjan"), in flower and fruit throughout winter in sheltered gardens, which is not possible in Iraq owing to frosts; Ladies' Fingers (Arabic "Bamia"), also gathered throughout winter; Radishes—small, round, red radishes were first seen for sale December 23, and Carrots were also then in season. A small Bean like the Haricot (Arabic "Lobia") is grown in summer and stored for winter; I often ate it in hash.

I found no Saffron grown locally, but a quantity is sold in the bazaar in tins and is imported from Spain by an agent in Bombay. Saffron is used for flavouring coffee, and women stain their foreheads with it. European Saffron is manufactured from the yellow *Crocus*, for which flower the Persian name is "Zafa-

ran." Bastard Saffron is manufactured from a yellow Thistle-like plant, *Carthamus tinctorius*, of which there are specimens in the British Museum from Muscat.

Plants of Cotton were in flower and the bolls were bursting in December. The cotton was short-stapled and the fibre coarse, but it is not a fair time of year to criticise—it might be much better in the summer. The flowers were pale yellow, the petals pinkish at the edge; height of plant, 3 to 4 feet. Here and there an uneven row of plants is seen, but it is not grown with any system and the growth is not strong. Probably good Cotton could be grown with care, but the area that could be put under Cotton would be insufficient to make it worth while producing over local requirement. Most of the cultivated land is much shaded by palms and would get insufficient sun for a Cotton crop.

Huge Citrons were being gathered and were on sale in the bazaar on December 23. Oranges were gathered and all disposed of when I arrived on November 20.

Melon-beds were being sown January 31. The places selected were the most sheltered, where scanty palms gave the sun access to the ground.

List of eight Plants mentioned by the Al Murra guide as being found in the region of Magainma in the Al Rimal or in the centre of the Great Sand Desert.

Three names have been identified by the Arabic name in the Appendix to *The Heart of Arabia*.

Zahar : *Tribulus alatus* Del. (Zygophyllaceæ).

Andab : seen also in Jafura—a kind of drought-resisting grass.

Sabat : *Gramineæ* sp.

Jemin : ?

Hadh : *Salsola* sp. (Chenopodiaceæ).

Alqa : ?

Halab : ?

Birqan : ?

APPENDIX VII

GEOLOGICAL NOTES

Notes on Rocks collected by Major R. E. Cheesman in Central Arabia. By W. CAMPBELL SMITH, M.C., M.A.

Most of the rocks collected by Major Cheesman are white sandy limestones, or rather calcareous sandstones, consisting of about 50 per cent. of very fine angular quartz-sand in an opaque chalky matrix. The actual proportion of quartz-sand no doubt varies from place to place. Some beds contain little pebbles nearly a quarter of an inch in diameter.

This white chalky sandstone appears first in the neighbourhood of Hufuf, and specimens were collected from Jabal Abu Ghanima and from Qara Hill, nine miles N.E. of Hufuf. Farther south it was found forming Jabal Harmaliya and Jabal Kharma Zarnuqa in the Jafura plain.

An exactly similar white calcareous sandstone appears again forming the top of Jabal Jabrin al Wasti, S.E. of Jabrin oasis, and apparently constitutes most of Jabal Jawamir too. Photographs of the outcrops taken by Major Cheesman show that the bedding is approximately horizontal. It is separated from the more northern outcrop by extensive gravel plains. Near Jabal Jawamir it appears to be underlain by sandy beds sometimes salt-bearing. For example, the material thrown out from a well-sinking one mile south of Jabal Jawamir is a grey friable sandstone, and at Jabal Jawamir itself there occur white and salmon-pink sands in which salt acts as a cement, making a hard stone which crumbles in water to a fine sand.

Unfortunately the limestone yielded no fossils except one specimen of an Astræid coral from Harmaliya plain, of which the original calcium carbonate has been replaced by chalcedony, a replacement which has almost entirely removed all trace of structure and has rendered the fossil quite unidentifiable.

In some respects the lithological characters of this chalky

sandstone might agree with G. E. Pilgrim's ¹ description of the white limestones of Bahrain Island, which are ascribed to the Eocene (Lutetian) period, and some support to this supposition is given by the presence on the Harmaliya plain of masses of chalcedony which may have weathered out of the limestone.

On the other hand, close comparisons can be made with the calcareous sandstones found by W. K. Loftus at Meshed Ali, near Bahr-i-Najaf, on the west of the Euphrates and placed by him in his Gypsiferous series; that is in the Fars series (Miocene) in Pilgrim's classification. Some specimens of Loftus's calcareous sandstones are in the British Museum collections, and the resemblance to Major Cheesman's rocks from Jabal Abu Ghanima is certainly very close. Unfortunately no specimens from Bahrain Island are available for comparison, and in the absence of fossils any attempt to suggest the horizon which these rocks represent is mere guess-work.

Mention was made above of wide gravel plains which separate the two limestone areas of Hufuf and Jabrin. The gravel extends from Harmaliya in the Jafura desert, across the plain of Saramid, and (south of Wadi Sahba) to the top of Jabal Aqla, beyond which the white chalky sandstones appear again.

A collection from any one locality contains several different kinds of pebbles, but at all the localities the same types are represented.

Most of the pebbles collected by Major Cheesman can be classified as follows in order of the abundance in his collection:

1. Compact buff-coloured limestones with some fine dendritic markings.
2. Quartz, for the most part white and opaque.
3. Pale green epidotised and silicified volcanic ashes.
4. Black banded rhyolites.
5. Blue-grey slaty rock, possibly an ash.
6. Jasper.
7. Very rarely fragments of (a) red quartz-porphry, and (b) very fine-grained granite.

The immediate source of these pebbles seems to be a conglomerate which is weathering down to gravel in places. A sandy, slightly calcareous conglomerate containing pebbles of

¹ Pilgrim (G. E.), "The Geology of the Persian Gulf and the adjoining portions of Persia and Arabia," *Memoirs of the Geological Survey of India*, Vol. XXXIV. Part 4, 1908.

limestone and quartz was found by Major Cheesman below the loose gravel of the Jafura desert. Another conglomerate with a hard white chalky matrix and abundant round flat pebbles of compact yellowish limestone was found in the bed of the Wadi Sahba: this contains water-worn pebbles of at least the first three types mentioned above. If an extensive bed of conglomerate underlies the gravel plains its weathering would readily supply the pebbles, the finer materials being carried away by wind and solution. We have no knowledge of the original source of the pebbles which went to form the conglomerate, but we may hazard again a guess at the age of the deposition of the conglomerate itself. In South-west Persia and in Iraq conglomerates are strongly developed, sometimes reaching a thickness of 1000 feet and characterised notably by pebbles of red and green chert and limestone. These conglomerates with some grit beds form the Bakhtiyari series of Pilgrim, believed to be of Pliocene age, and overlie unconformably the Fars series (Miocene). Loftus¹ observed these conglomerates on the Euphrates and placed them in the upper part of his Gypsiferous series. Unfortunately no samples of the conglomerates are preserved in his collection in the British Museum, but he has given an excellent record of the variety of pebbles found at these localities, and a comparison of his lists with the one given above shows a very close similarity.

At Iskanderia (Khan Iskandariyah), between Baghdad and Hilla, he recorded seventeen kinds of pebbles, of which we may mention :

- “ 1. White, reddish, yellowish and milk-white quartz.
6. Cherts of various colours, from grey to almost black.
7. Light green chert, approaching jade.
9. Jasper, chiefly red, and brown-veined.
10. Waxy indurated limestone, whitish, green, grey, blue-black, and black: some varieties approaching marble.
12. Flinty slate, from grey to black.
13. Granite of fine-grained variety: greenish-grey colour (very rare).”

Again at Akker Koof (Akkar Kuf), twelve miles N.W. of Baghdad, he gives the following account of the pebbles in a “gravel” there: “the same pebbles as at Iskanderia, excepting those mentioned in the list as rare:

¹ Loftus (W. K.), *Quart. Journ. Geol. Soc.*, 1855, Vol. XI. pp. 256, 257.

" In addition I collected there the following :

Pinkish granite, composed of quartz, feldspar, and oxide of iron (rare).

Porphyry (?) one.

Light-brown compact limestone with veins of serpentine.

Many quartz, jasper, chert, and limestone pebbles, flattened so as to be easily mistaken at first sight for coins.

"The following is a rough percentage of the pebbles found at Iskanderia and Akker Koof :

Quartz, 30.

Chert, flint, and jasper, 40.

Limestone, sandstone, flinty slate, serpentine, porphyry (?), granite, nummulitic and coralline limestone, 30."

Allowing for the possible identifications of the black rhyolites and bright green ashes as black and green chert, every kind of pebble collected by Major Cheesman in Jafura seems to be present also in the conglomerates described by Loftus in Iraq, and it seems quite possible that the Jafura conglomerates may belong to the Bakhtiyari series (Pliocene). If this is the case, the suggestion that the white chalky sandstones represent part of the Fars series becomes more probable, and we may imagine the conglomerate as possibly occupying a shallow syncline or depression and overlying the chalky sandstones which outcrop north and south of it.

Major Cheesman has mentioned the fact that he collected a solitary and much-weathered granite pebble from the sands thrown out of a well a mile south of Jabal Jawamir. It is a pink millimetre-grained granite rock, very much altered, veined with quartz, and impregnated with traces of manganese oxides. Its appearance quite alone in the sands is odd, but small pebbles derived from granitic rocks were found on the gravel plains and are recorded by Loftus in the conglomerates on the Euphrates, and we must attribute this bit of granite to a similar source to the gravel. In any case it seems much too poor a granite to have ever been used for building or decoration.

Mention must also be made of the many beautiful examples of Etched Pebbles—*Rillensteine* of some German authors—which here as in other desert areas are afforded by the limestone pebbles. Many of the limestone pebbles of all shapes and sizes are delicately furrowed by little solution-channels which

show every variation in shape, from almost straight ones to complicated forms recalling the convolutions of the human brain. It is noticeable that these furrow-patterns are only found on the limestone pebbles, and that they cover the entire surface of the stone even when it has been deeply embedded in sand. Some which have been exposed to the wind show how the wind-blown sand has commenced to polish away the edges of the furrows, and begun the development of the facetting so well known in the faceted-pebbles (*Dreikante*) of sandy deserts.

According to J. Walther, who has made a thorough study of desert conditions, etching of the limestone pebbles takes place in the soil where surface-solutions become concentrated. The etched pebbles are found to a depth of ten to twenty centimetres only. Gradually they work their way to the surface, where, unless exposed to wind-blown sand, they may retain their ornamented surfaces almost unimpaired for long periods.

LIST OF MAJOR CHEESMAN'S SPECIMENS

	Jabal Abu Ghanima, Hufuf.		White calcareous sandstone.
	Qara Hill, 9 miles N.E. of Hufuf.	23. xi. 23.	White calcareous sandstone.
5164.	16. Jabal Harmaliya.		White calcareous sandstone.
	8.		{ Silicified astræid coral.
	8. Harmaliya plain.	14. ii. 24.	
5165.	8.		{ Etched and wind- worn pebbles of limestone.
	10. Saramid plain.	15. ii. 24.	
			Wind-worn pebbles. White quartz, "walking stone."
	15. Bed of Wadi Sahba ; 6 in. below sand of present bed.	15. ii. 24.	Sand with water- worn-pebbles.
	11. Jabal Aquala.	18. ii. 24.	Quartzite pebble from mud-brick of ruined castle.
	6. Jabal Jabrin al Was- ti, S.E. of Jabrin palm area. Loose rubble.	20. ii. 24.	White calcareous sandstone.

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|-------|-----|---|-------------|--|
| 5165. | 3. | Same place. <i>In situ</i> . | | White calcareous sandstone. |
| | 12. | Jabal Jawamir. | | White calcareous sandstone. |
| | 7. | Jawamir. Below calcareous sandstone. | | White and pink sand cemented with salt. |
| | 4. | Excavation for dead well one mile south of Jabal Jawamir, Jabrin. Near ruined castle. | | (1) Loose grey sand.
(2) Pebble of calcareous sandstone.
(3) Pebble of much-weathered fine-grained granite. |
| | 14. | Jabal Aqula, top. | 24. ii. 24. | Etched and wind-worn pebbles of various kinds. |
| | 13. | Bed of Wadi Sahba. | 25. ii. 24. | Hard white conglomerate with water-worn pebbles of limestone. |
| | 5. | Jafura desert. | 25. ii. 24. | (1) Small etched and wind-worn pebbles of various kinds.
(2) Large etched pebble of limestone.
(3) Nodule of pale-grey chalcedony. |
| | 9. | Jafura desert. | 26. ii. 24. | Friable conglomerate with water-worn pebbles. |
| | 2. | Jabal Kharma Zarnuqa. | 29. ii. 24. | White calcareous sandstone. |

APPENDIX VIII

METEOROLOGICAL RECORD

(Shade temperatures except where stated otherwise,
Fahrenheit.)

1923.			
17. xi.	Oqair.	Temp. at 3.50 p.m. G.M.T.,	72°. Bar. 30.2.
18. xi.	"	" at sunrise	60°, at local noon, 78°. Bar.
			30.15.
22. xi.	Hufuf.	" at local noon	71°. Bar. 29.68.
24. xi.	"	" 1 hour after sunrise	69°, 3 hours after sunset 69°.
25. xi.	"	" at local noon	70°, in sun, same time, 84°.
27. xi.	"	" at sunrise	67°. Bar. 29.76.
28. xi.	"	" " 62°, at 8 p.m. local	64°.
29. xi.	"	" " 61°.	
1. xii.	"	" " 54°. Bar.	28.0.
2. xii.	"	" " 60°.	
3. xii.	"	" at local noon	77°, in sun, same time, 92°.
6. xii.	"	" at sunrise	59°.
7. xii.	"	" " 66°. Bar.	29.64.
9. xii.	"	" " 59°. Bar.	29.8.
10. xii.	"	" at local noon	74°, in sun 85°.
12. xii.	"	" at sunrise	60°.
13. xii.	"	Bar. at 4.10 p.m. G.M.T.,	29.6.
14. xii.	"	Bar. 1 hour after sunset,	29.7.
15. xii.	"	Temp. at local noon	73°, in sun, same time, 85°.
18. xii.	"	" at sunrise	58°.
20. xii.	"	" at local noon	71°. Bar. 29.75.
21. xii.	"	" at sunrise	52°.
22. xii.	"	" " 51°.	
25. xii.	"	" at local noon	66°, at 8 p.m. local 65°.
26. xii.	"	" at sunrise	55°.
28. xii.	"	" " 50°. Bar.	29.8.
1924.			
6. i.	"	" " 53°.	
8. i.	"	" " 54°.	
10. i.	"	" " 62°. Bar.	29.65.
14. i.	"	" " 62°. Bar.	29.6.

1924.				
15. i.	Hufuf.	Temp. at sunrise	55°.	Bar. 29.6.
16. i.	"	"	48°, at local noon	64°.
17. i.	"	"	50°.	
18. i.	"	"	53°.	
19. i.	"	"	49°.	
20. i.	"	"	49°.	
21. i.	"	"	56°.	Bar. 29.7.
22. i.	"	"	56°.	Bar. 29.6.
23. i.	"	"	63°, at local noon	74°. Bar.
			29.5.	
24. i.	"	"	63°.	Bar. 29.5.
25. i.	"	"	61°, at local noon	72°. Bar.
			29.7.	
26. i.	"	"	57°.	
27. i.	"	"	59°, at local noon	76°.
28. i.	"	"	62°.	
29. i.	"	"	64°.	Bar. at 7 p.m. local,
			29.55.	
30. i.	"	"	63°, at local noon	71°. Bar.
			29.6.	
31. i.	"	"	66°, at 3 p.m. local	75°.
			Bar. 29.45.	
1. ii.	"	"	58°.	
2. ii.	"	"	51°.	Bar. 29.6.
3. ii.	"	"	58°.	
4. ii.	"	"	53°.	Bar. 29.5.
5. ii.	"	"	52°, at 3 p.m. local,	69°.
6. ii.	"	"	53°, at sunset	61°, 2 hours
			after sunset	57°, and same
			time in my room	62°.
7. ii.	"	"	47°, at local noon	59°, noon
			in sun	77°.
8. ii.	"	"	46°.	Bar. 29.67.
10. ii.	Dalaiqiya.	Temp. at dawn	51°.	Bar. 29.5.
10. ii.	Zarnuqa.	Temp. at 1.15 G.M.T.,	81°.	Bar. 29.6.
11. ii.	"	"	at dawn	48°. Temp. of sand 3 inches
			below surface at same time	54°.
			Bar. 29.6.	
12. ii.	"	"	at sunrise	52°. Bar. 29.7.
13. ii.	Janah Jafura.	Temp. at sunrise	42°.	Bar. 29.6.
13. ii.	Jabal Dharabin.	Temp. 1 hour after sunset	59°.	Bar.
			29.55.	

1924.			
14. ii.	Jabal Dharabin.	Temp. at sunrise 37°.	Bar. 29.4.
15. ii.	Zaida Jafura.	At sunrise heavy white fog and dew.	Bar. 29.3.
15. ii.	Wadi Sahba.	Temp. 1 hour after sunset 70°.	Bar. 29.38.
16. ii.	" "	" at sunrise 50°.	Bar. 29.35.
16. ii.	Jabal Aqula.	" 1 hour after sunset 68°.	Bar. 29.6.
17. ii.	" "	" at sunrise 45°.	Bar. 29.5.
17. ii.	Jabrin.	Temp. at 11.15 G.M.T. 85°.	Bar. 29.5.
18. ii.	" "	1 hour after sunrise 64°.	Bar. 29.5.
18. ii.	" "	at 3 p.m. local 84°.	
19. ii.	" "	1 hour after sunrise 59°.	Bar. 29.47.
19. ii.	" "	at local noon 86°, in sun, same time,	111°.
20. ii.	" "	at sunrise 59°.	Bar. 29.6.
21. ii.	" "	" 48°.	Bar. 29.55.
22. ii.	" "	" 55°.	Bar. 29.4.
22. ii.	" "	in tent at local noon 90°.	
23. ii.	" "	at dawn 58°.	Bar. 29.38.
23. ii.	Jabal Aqula.	Temp. at 1 p.m. G.M.T. 92°.	Bar. 29.53.
24. ii.	" "	" at dawn 56°.	Bar. 29.8.
24. ii.	Wadi Sahba.	" at 5 p.m. G.M.T. 77°.	Bar. 29.3.
25. ii.	" "	Bar. 29.2.	
26. ii.	Zaida Jafura.	Temp. at dawn 58°.	Bar. 29.1.
26. ii.	Jabal Dharabin.	Temp. 2 hours after sunset 83°.	
27. ii.	" "	" at dawn 63°.	Bar. 29.45.
28. ii.	Zarnuqa.	Temp. at dawn 48°, at local noon 78°, in sun, same time, 101°.	Bar. 29.6.
29. ii.	" "	" at dawn 47°.	Bar. 29.68.
1. iii.	Dalaiqiya.	Bar. 29.67.	
2. iii.	Hufuf.	Temp. at dawn 65°.	Bar. 29.58.
3. iii.	" "	at sunrise 60°.	Bar. 29.5.
6. iii.	Oqair.	" at dawn 59°.	Bar. 30.2.

ARABIC NAMES FOR STARS.

North Star, *Yedi* or *Jedi*.
 Pleiades, *Dhraya*.
 Great Bear, *Bnat Thnash*.
 Orion, *Mizan* (badawin, *foza*).

Sirius, *Mirzam*.
 Canopus, *Sohail*.
 Venus, *Zahra*.

APPENDIX IX

STORES

- Whetstone for knife and scalpel.
- Water-colour paint-box and sketch book for colour of fish and reptiles and flowers.
- 2 camel-hair paint-brushes.
- India-rubber.
- 1 ball of strong twine (3 better).
- Corkscrew.
- Screw-driver, large.
- do. small for theodolite.
- Medicine chest, strong wooden box and rope handles; inside measure 16 in. \times 10 \times 6 deep; tight-fitting lid with strong iron hinges.
- Castor-oil, big bottle.
- Iodine, tincture of, $\frac{1}{4}$ -lb. bottle.
- Permanganate of potash crystals.
- Vaseline, 3 small bottles.
- Camphorodyne—dose 15 drops.
- Hypodermic syringe and formalin.
- Eucalyptus oil.
- 6 first-aid bandages—2 $\frac{1}{2}$ inch, 6 yards—compressed.
- Cotton wool.
- 2 first field dressings.
- 1 bottle Eno's Fruit Salts.
- Zinc oxide in Eiffel Tower Lemonade bottle.
- 100 aspirin tablets.
- Iodoform powder in Eiffel Tower Lemonade bottle.
- 100 quinine sulphate tablets (not enough, as in great demand; everywhere appreciated).
- Small bottle brandy in Eiffel Tower Lemonade bottle.
- 2 ordinary bottles of brandy.
- 1 bottle of whisky.
- 3 small Bovril bottles.
- Boracic acid powder (forgotten and wanted).

Tooth embrocation (forgotten and wanted).

Clinical thermometer (forgotten and wanted).

2 home-made flower presses of blotting-paper sheets—9 in. square and stiff cardboard back.

Butterfly net. Cane weak near Y-piece, and cracked. I strengthened it with a strut from Y to top centre of net.

Killing bottle.

Entomological pins.

Folding papers, greaseproof, for butterflies.

Small packet naphthalene.

Cork-lined box, 8 in. × 10 in.

Taxidermy :—

Tin box, 9 in. × 7 in. × 2½ in. high. Contains :

½-lb. tobacco tin of arsenical soap.

1 pencil stump.

1 box stout brass pins.

1 oil stove, small.

1 reel, 200 yards, best six-cord cotton.

1 needle.

50 printed labels for skins.

20 skull labels.

1 pair big scissors.

1 pair nail scissors, sharp points and best steel, English.

1 pair steel champagne wire nippers.

2 scalpels, or pocket knives.

1 big skinning knife.

1 file, flat.

1 pair pointed tweezers.

1 pair brass dividers.

1 brass millimetre and inch scale—6 inches.

1 big glue brush
1 small paste brush } for arsenical soap.

Few pieces of cotton wool.

Few pieces of deal box wood for supporting skin.

1 lb. arsenical soap in reserve.

3 lbs. naphthalene, loose crystals.

Packet needles.

4 1-lb. rolls cotton wool.

2 sizes tail wires.

1 2-gallon screw-top petrol can containing 1 gallon methylated spirit.

1 big-mouthed jar—10 inches high, mouth 3¾ inches wide.

This was carried empty and used to soak specimens in spirit

- for 2-3 days, after which they were removed and packed dry in cotton wool (big ones dried in the sun) and spirit returned to petrol tin. Tobacco tins used instead of jar for small specimens. On march specimens carried in jar in cotton.
- 410 gun in canvas cover, with brass cleaning-rod.
 - 300 •410 cartridges loaded dust shot.
 - 300 •410 cartridges loaded 6 shot.
 - 12-bore gun in hard gun-case, cleaning-rod and oil-bottle, with reserve of rifle oil.
 - 300 12-bore cartridges loaded dust shot.
 - 300 ditto, loaded 7 shot.
 - 100 ditto, loaded 4 shot.
 - 25 lethal (if gun-barrels non-choke).
 - 25 12-bore No. 1 shot (forgotten, but needed for Eagles, Gazelle).
(The above is reckoned at 5 cartridges per gun per diem of expected duration of tour, divided equally between dust and No. 7 shot, and 20 per cent. of each in addition to be left at base as reserve. Packed in tin-lined boxes, with number and size of shot marked outside each.)
 - 12 steel spring traps, rat size.
 - 12 ditto, mouse size.
 - Supply of 2 or 3 dried cokernuts.—Note: 2 strong gins for Jackal and Wolf should be taken.
 - Camera:—
 - No. 3 ($\frac{1}{4}$ plate) Autographic Kodak Special. Zeiss Lens = $3\frac{1}{4} \times 4\frac{1}{4}$ films; the autographic pencil spliced and suspended by thread.
 - 24 $3\frac{1}{4} \times 4\frac{1}{4}$ autographic Kodak films—6 exposures—packed in tins.
 - 4 $3\frac{1}{4} \times 4\frac{1}{4}$ autographic Kodak films—12 exposures.
(Above dated to expire September 1924, or 11 months from commencement of journey.)
 - Theodolite box, 43 in. \times 11 in. by $6\frac{1}{2}$ in. deep, all inside measures, of $\frac{7}{8}$ in. deal. I had the screws removed from top on steamer and 2 hinges substituted, as screws for field work were impossible. Closed by a rope. Contains:
 - 1 3-in. theodolite and stand.
 - 1 hypsometrical apparatus; boiling-point apparatus in leather case, with 3 thermometers 0-140° F. and 2 of 180° to 215°.
 - 1 aneroid barometer.
 - 1 electric torch for star-work and 3 refills.
 - Nautical Almanack* 1923 and 1924.
 - Field angle book—should be bound in colourless canvas.

1 bottle of methylated spirit for boiling-point apparatus.

Hints to Travellers, 2 vols. Computation forms E. and W. stars.

1 pocket chronometer, carried in my pocket always and wound night and morning.

1 prismatic compass, carried in pocket always.

1 stiff-backed note-book, leather bound, or canvas would be

better, 120 pages $4\frac{1}{2} \times 6\frac{1}{2}$, ruled

l	m	s	'	miles per hour.
---	---	---	---	-----------------------

Carried in pocket always.

1 Officer's Service haversack, large size, $13\frac{1}{2}$ in. deep, top of bag to bottom.

1 ditto small, 11 in. deep; useful for cartridges, but larger size most serviceable for cartridges, traps, specimens or kit.

2 Venesta boxes of latticed wood, tin-lined, with 6 trays of different depths—tray sides of wood and bottoms of cloth.

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PRINTED IN GREAT BRITAIN BY
RICHARD CLAY & SONS, LIMITED,
BUNGAY, SUFFOLK.

